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VOLUME 1, NUMBER 4 MAY 1986
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EQUITY I, II, III:
The Entire Line Unveiled

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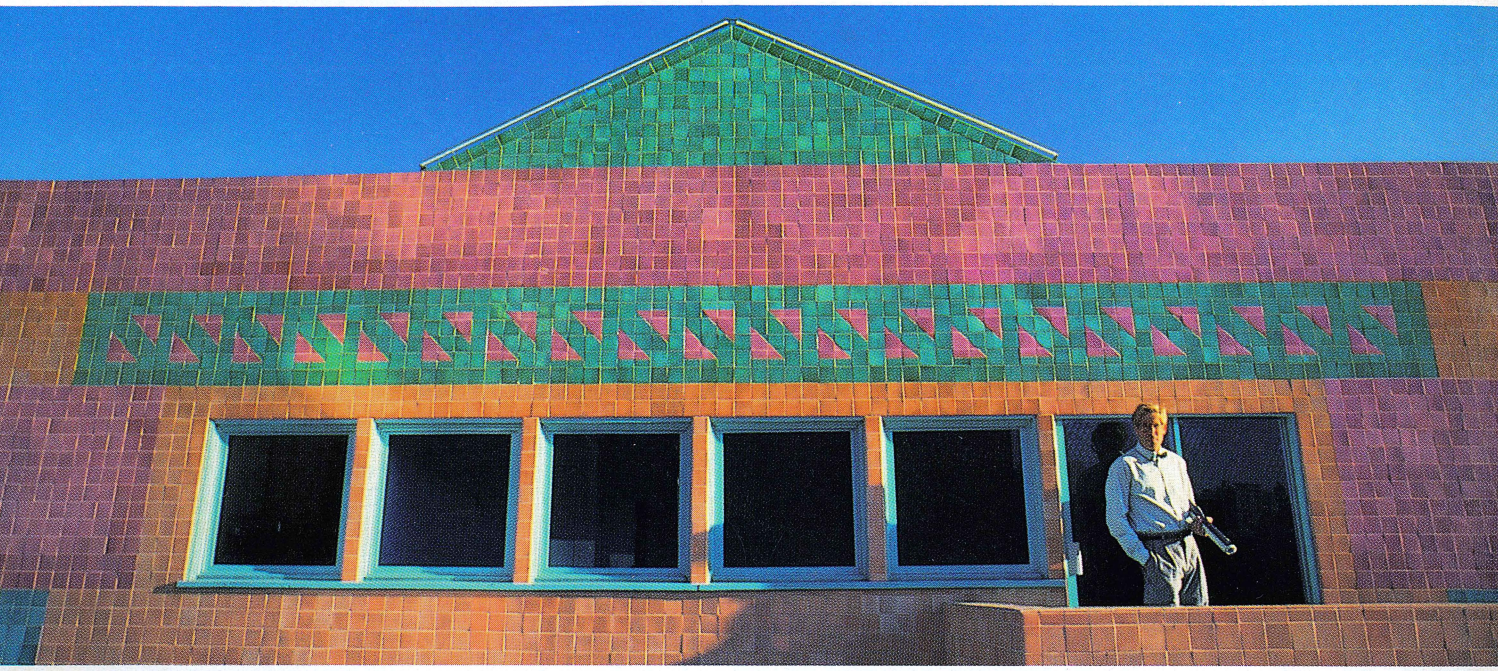

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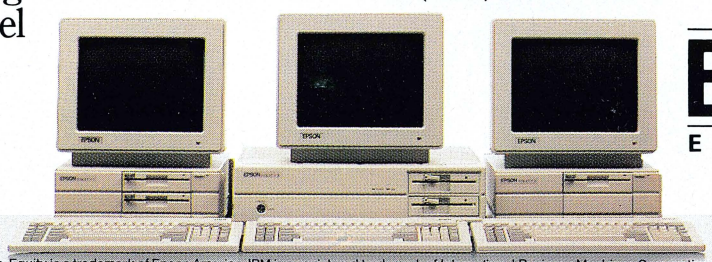
For more facts about the Equity line of personal computers, call (800) 421-5426, or (213) 539-9140 in California.



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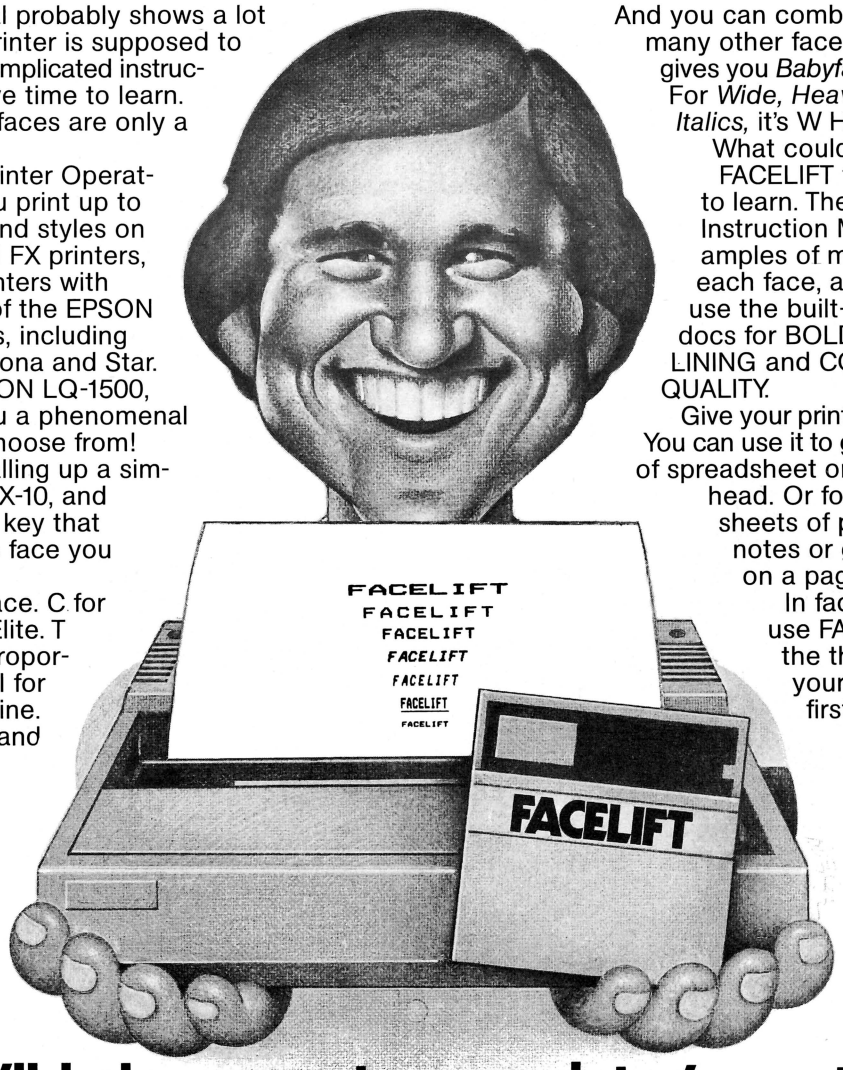

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Cover photograph by Benjamin Magro

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Epson World is published monthly by Camden Communications Inc., Highland Mill, P.O. Box 250, Camden, ME 04843. Application for mailing at second class rates pending at Camden, ME and additional mailing offices. Postmaster: Address changes to Camden Communications Inc., Highland Mill, P.O. Box 250, Camden, ME 04843. Copyright 1986 by Camden Communications Inc. All rights reserved. *Epson World* is an independent publication of Camden Communications Inc. and is not affiliated in any way with Epson America, Inc. Epson, HX-20, Geneva, PX-8, QX-10, QX-16 and Equity are trademarks of Epson Corporation.

Contributors: Manuscripts and photographs are welcomed. Publisher assumes no responsibility for the return of unsolicited manuscripts, queries or artwork.

Subscriptions are $32 for 12 issues. User group subscription rates available. Please inquire for delivery rates outside the U.S.. Dealer inquiries invited.

ISSN 8755-1047

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They say first impressions are lasting impressions. I usually agree with that statement in direct proportion to the first impression I have of someone else. I hope you get the impression from this column's heading that we at Epson World are a bunch of friendly, witty folks who love to produce computer magazines. It goes without saying this impression would be favorable, and is an accurate barometer of how to gauge this publication.

If your impression was unfavorable, don't worry, it doesn't mean a thing. Read on, you'll see. Trust me.

You also probably received the impression from the heading, not to mention the cover photo, that this magazine will be covering the MS-DOS world, specifically, the Epson Equity.

Well, let's slow down a bit here and explain what's going on. Epson World, published by Camden Communications, Inc. (CCI), located a mere 147 miles from the Canadian border in the picturebook village of Camden, Maine, has purchased The Epson Connection from the redoubtable Carolyn McCarthy and Maureen Mertz. For you Epson Connection subscribers, you will recall Carolyn's announcement and CCI editorial director J.D. Hildebrand's confirmation of this fact in the March (and final) issue of The Epson Connection.

Epson World now incorporates The Epson Connection, and will be a monthly publication. For newsstand distribution purposes, the cover date of this issue is May 1986, even though it was published exactly four weeks after the March Epson Connection. You will be receiving your June issues in another four weeks.

Epson World covered the HX, PX, and QX systems from Epson (as did The Epson Connection), and we will continue to do so. There are at least 35,000 QX owners out there in addition to the portable owners, and we will continue to be a strong editorial voice in support of you and your computers.

But we can't ignore the Equity. Epson is providing one the top IBM PC alternatives with Equity, and it's going to be fun to watch this market take off.

So, we'll cover all the bases. We'll continue our traditional strong QX coverage. Jim Hansen, for example, will continue to lecture on the benefits of the QX systems, and show you ways to enhance your investment. We'll also be showing you the world of MS-DOS — the amazing variety of software that has sprung up recently, and exciting things held by the future.

A valued feature of The Epson Connection, the Disk of the Month, will be continued. Allen Howell, the Connection's technical editor, will be putting together new disks every month. Look for his first one next issue.

For those of you with Epson Connection subscriptions, we'll fulfill them with Epson World. For those of you with Epson World subs, you'll get the number of issues due you as well. If you subscribed to both, add up the number of issues due you, and that's how many you'll get.

While I'm on the subject, I'm going to do some shameless begging. I have heard dozens, if not hundreds, of comments to the effect that "you'd sell a lot more magazines if you let people know about you." Well, we're trying. We have arrangements with authorized Epson user groups to distribute our magazine. We now reach all Epson Connection subscribers. We will have a strong newsstand presence in major bookstore chains throughout the country.

But we can't do it alone. Our readers must pass the word. Camden Communications publishes half a dozen computer magazines and a couple of newsletters. We're here to stay. But we are not a large enough company to hire some big football player to intimidate you into buying Epson World. No free telephone, chronograph, or swimsuit issue, sorry to say.

Now, turn the page and start reading. You have only a month before the next issue arrives.

Roger Strukhoff
Senior Editor

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These machines are *brand new,* and include CPU, Monitor, Slim-line HASCI keyboard (which will also work with your QX-10), cables, CP/M, MS-DOS, GW Basic and Valdocs 2.

But because Val-Ware is now the exclusive distributor of Valdocs Software, we've decided to make an offer that no one else can match: *Valdocs+III will be included absolutely free with every QX-16 purchased from Val-Ware.*

So, if you (or anyone you know) need or want a second computer, we urge you to take advantage of this terrific offer. But don't delay: *supplies are strictly limited,* and orders will be filled on a first-come first-serve basis. When these QX-16s are gone, that's it: this offer can *never* be repeated.

ORDERING INFORMATION

Mail your orders with Check or Money Order (personal checks require 15 days to clear) directly to Val-Ware at the address below. Software orders are shipped UPS prepaid. For QX-16 orders, include $50 for shipping, handling and insurance. Visa, Mastercharge and American Express orders may be placed by phone (sorry, no COD orders). Allow up to 4 weeks for delivery.

VAL-WARE DISTRIBUTORS, INC.

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(213) 377-4140

(Val-Ware Distributors, Inc. recently acquired the exclusive distribution rights for all Valdocs Software. Val-Ware was formed by a group of Valdocs users/businessmen dedicated to the continued delivery of fine products for your QX computer. Orders placed prior to April 3, 1986 will be filled by Rising Star. Rising Star will continue to provide Customer Service, and all Customer Service calls should be directed to them.)

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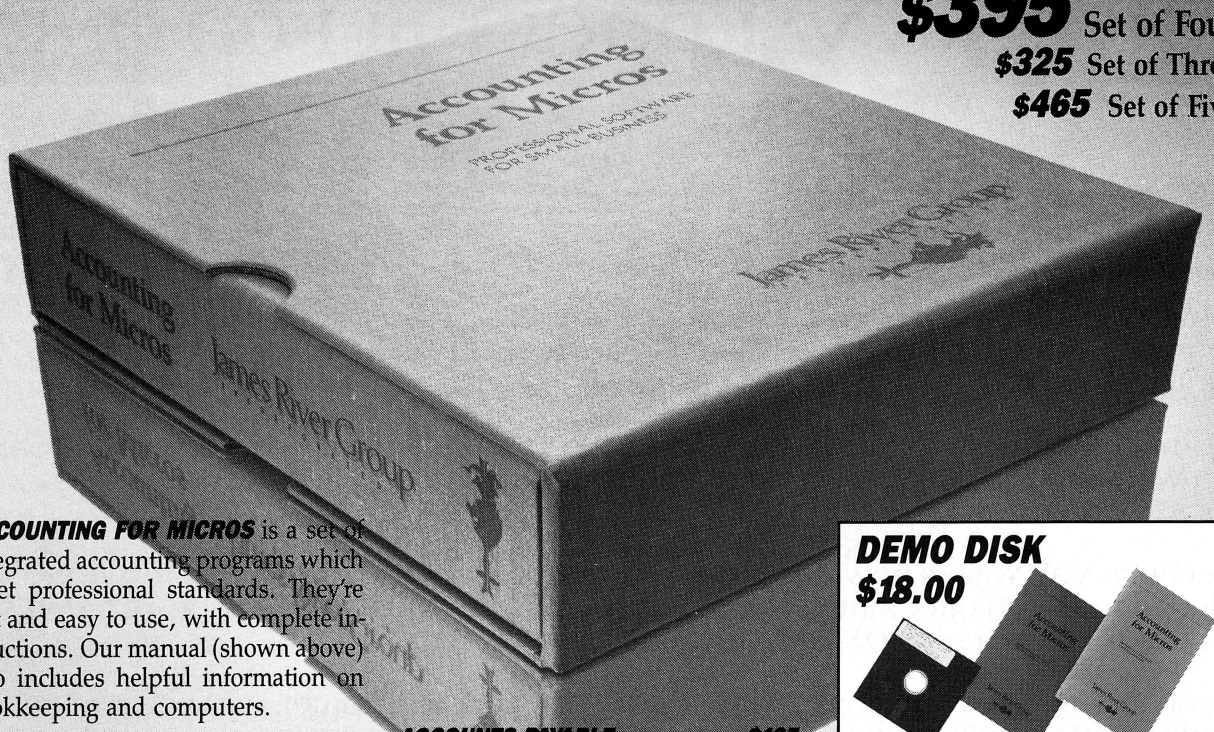

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Epson QX-10	*Radio Shack CPM*	*Other compatibles*

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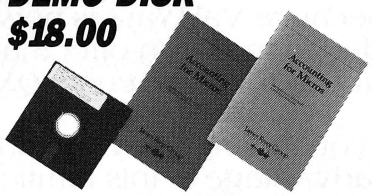

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PAST, PRESENT, FUTURE

Over the last few months a number of the events have rocked the Epson community; some good, some bad. Seldom satisfied with what I read in many of the user group newsletters, and dismayed at most of the news coverage found elsewhere, here is my personal perspective on several of the events important to Epson users that have occurred over the last year or so.

Major news stories include the introduction of the QX-16 computer, Epson's Interact '85 conference, the release of Valdocs 2, the parting of ways between Epson and Rising Star, the introduction of the Equity computer series and finally, the demise of the QX-10 and Titan Technology's MS-DOS expansion board for the QX-10.

In our Spring 1985 issue, we ran a review on one of the QX-16 prototypes that was available to us. Overall, the computer is not an improvement over the QX-10, but does have the ability to run some MS-DOS software. Execution of CP/M-based programs is considerably slower than on the QX-10 due to the hardware memory refresh scheme used. (It ties up the memory about 12 percent of the time, slowing program execution by that amount.)

We were also disappointed that the computer is only about "30 percent" compatible with the IBM product line, meaning that if your software isn't configured especially for the QX-16, there is a good chance it won't display or operate correctly. We noted these and other problems at the time of the review, thinking that they would be corrected before the system went into production. To make the story short, the QX-16 is not selling very well due to a combination of high price and poor dealer support and performance.

Epson's Interact '85 conference was enthusiastically attended. Overall reviews were mixed, due mostly to the wild variations in the speaker presentation quality ... to be expected in an undertaking of this scale. Given the complete sellout and user interest, we hope Epson will try it again.

One of the main attractions of Interact was the first release of Valdocs 2. As luck would have it, the disk duplicators made corrupted copies of about half the disks issued at Interact '85. Further, despite what RSI's Chris Rutkowski claimed was "the most tested software ever produced," the release was full of fatal, data-destroying bugs. And so is the current "fixed" release of Valdocs 2, if we are to believe reports coming into Epson World.

Shortly after Interact, and after three years of effort and $10 million of funding, Epson terminated its contractual relationships with RSI, and later in the summer of 1985 ceased production of the QX-10.

RSI's response to the problem is an interesting story. In a nutshell, this is what happened. At the time Epson cut the apron strings, RSI's main external revenue was from sales of RSIBASIC, ValDraw, ValPaint and the TPM-II and Valdocs technical manuals. The RSI staff was soon cut from over 100 down to about 85, and an intensive effort was made to find "new product."

Much of the "new product" was in the form of system utilities and other software left over from the demise of TDL, a company active in the late 1970's that spawned CDL and eventually RSI. Valdocs 2 was renamed Valdocs 2+, and an intensive direct sales campaign was initiated. It was clear from the start that the Epson QX-10 and QX-16 community (which numbers somewhere 35,000 and 50,000 depending on whom you believe) could not alone support a company the size of RSI.

This spring, Atari's new 520 ST computer became news and RSI's Gale Carr extracted an agreement from Atari that basically said it was OK to develop software for the 520, and that maybe Atari would help distribute it later. She is reported to have been pleased to deal with a person as "straightforward and honest" as Jack Tramiel. According to press announcements, the first software for this computer was to have been delivered in September of 1985, but nothing ever did come of the project. RSI recently announced it has terminated its agreement with Atari.

As Valdocs 2+ became more operable over the summer of '85, it was apparent that the QX-10 computer system was stretched to capacity and that promised performance could not be delivered. RSI arranged a special deal with Semi-disk to provide (in the $700 range) a semiconductor-based disk drive that eliminates much of the well-known disk grinding performed by Valdocs software.

More recently, RSI has also announced another option board being developed for the QX-10 to speed Valdocs performance. Dubbed "V-MAX," it provides a Hitachi CPU that should also speed up Valdocs. No price or availability has yet been announced, but a good guess might be something in the $250 range.

About mid-summer of last year, Epson announced the Equity series of MS-DOS personal computers, recognizing that the CP/M market is now gradually starting to fade. Delivery of these systems began in the early fall.

About the same time, RSI, becoming desperate for revenue, developed a new "innovative" marketing plan. For a fixed price, untested versions of Valdocs 2+

Text continues on page 41

A FEW TRICKS OF THE TRADE

Here are a few Epson QX-10 tricks I haven't seen before. I hope they prove of value to your readers.

1. I suspect I'm not the only user who's had trouble using Peactext spellcheck program with Valdocs. Often documents which have been spellchecked flicker or undulate on the screen when retrieved, and the cursor is unresponsive.

The reason for this is simple. Every time you spellcheck a document, Peachtext presents you with a "T" as a possible misspelling. This "T," however, will not be found in your text. It is the invisible character Valdocs uses at the beginning of the document to indicate the top margin (e.g. t5). If you tell Peachtext to mark the "T" it is replaced with an "[." Your document then has no indication of top margin. Valdocs can't make sense of it, and the problems begin.

The solution is even simpler. When Peachtext shows you a "T," just <A>dd it to your dictionary and your troubles are over.

2. I've heard many people say they sometimes - and unpredictably - have trouble getting documents to print under Valdocs 1.19. I don't know *why* this happens, but you can always tell *when* it's going to happen: as you are going through the print menus the time will disappear from the lower right hand corner of the screen. This inevitably means the document won't print. The only way I've found to correct this is to turn off the printer and reset the computer. It seems to me that documents with little empty space at the beginning are the most likely to refuse to print, so I often go back and add a few Returns to the top. But this may be just a placate-the-gods superstition.

3. In the Spring 85 issue you published a tip about adding the Peachtext spellcheck program to the Valdocs system disk. I actually tried this many months ago, but it didn't work because my CP/M disk (R2.2, version A2.21) could not, either in CP+ or CP/M, find any files on the Valdocs system disk except textstat.tmp, textundo.tmp and textwork.tmp.

But your article inspired me to try other ways. Here's one that works for the older version of CP/M. First, exit CP+ to CP/M. At the A>, type "copydisk." Then use the "copy system files" option to copy the system files from a Valdocs system disk (left) to a blank disk (right). Then press reset button to return to Valdocs, and use Valdocs copydisk to copy the necessary files as indicated in your article. This works for me but I'm sure there are easier ways to do this.

I hope these will be of some use to somebody.

James Richardson
East Brunswick, NJ

FROM EPSONLINE

One of the strengths of the Epson community has been the interaction among users. This tradition continues on EpsonLine, a special interest group (SIG) available from CompuServe. The sysop is John Ross. Epson World will be publishing selected EpsonLine correspondence sent to us. Our address is 75675,1122. This month, we have one letter. Next month, who knows?

(In response to my earlier question) I feel I have heard from a "real person," and it is comforting to know that someone is following up on questions asked. I have received my March issue of Epson Connection. Now, I look forward to the new Epson World Magazine. Thank you.

Jack Shaw
76576,1273●

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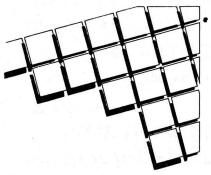

Then develop your ideas using a familiar outline format. Change the structure as easily as you change your mind. Move an idea and all attached text moves with it.

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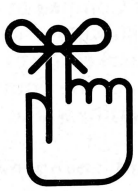

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EPSON MERGES WITH ITS PARENT

Epson Corp. merged with its parent, Suwa Seikosha Co., late in 1985, forming a new company known as Seiko Epson Corp. The merger consolidates management and resources but will not affect brand names, overseas marketing, or distribution, according to Seiko Epson president and chief executive officer Ichiro Hattori.

The merger is not expected to affect Epson America, located in Torrance, Calif., in any appreciable way. Epson Corp. was to have had estimated revenues of $800 million in 1985; annual revenues of Seiko Epson are expected to be in the range of $1.5 billion. Seiko Epson, headquartered in Nagano, Japan, is in turn part of Japan's Seiko Group, a $3.5 billion conglomerate best known for its watches. The Seiko Group has been around since 1881. Epson America was founded in 1975 as an original equipment manufacturer (OEM) of computer components and peripherals, introducing its first end-user product, the MX-80 dot-matrix printer, in 1979.

Equity a Good Move, Says InfoCorp

First there was art, then there were critics. So the saying goes. In the computer business, first there are computers, then there are critics, then there are market researchers. The critics tell us if the art or computers are any good or not, and the market researchers tell us whether or not that matters.

One such market researcher, Cupertino, California-based InfoCorp, says thumbs-up to Epson's Equity line of IBM PC-compatible microcomputers. An InfoCorp report authored by Abbi Lawrance says Epson "has done its homework" with Equity. A "well-thought-out marketing strategy" by Epson gives the company "a good chance of garnering market share," says the report. "In time, that market share could indeed be significant," it concludes.

TO THE GOOD

Key points of Epson's strategy for the Equity, according to this report, include: introduction of an entire product line, and not a single system; low price; generous dealer margins; leveraging a dealer sales force that calls on more than 4,000 dealers; and reliance on a reputation that's made it the leading computer printer company in the United States for more than five years.

InfoCorp points out that Equity was designed in the U.S. by people "knowledgeable in the needs and requirements of the U.S. market." But manufacturing costs will be kept down because Equity won't be built in the U.S. Furthermore, the report points out, Epson makes its own disk drives, one of the most expensive and least reliable of computer components. This fact gives Epson "a strong price advantage and the ability to closely control disk quality," says InfoCorp.

Backing the design is "a parent company (Seiko Epson of Japan) with a long history of successfully manufacturing, distributing and selling products, and with the financial resources to mount the full campaign," the report states. Seiko Epson is part of the Seiko Group, a Japanese conglomerate with $3.5 billion in annual sales.

The full campaign for Epson means following "the Compaq model," according to InfoCorp. That is, sell computers primarily through the retail channel, rather than through a variety of channels. Compaq was one of the first IBM PC-compatible (or clone) manufacturers, and is by far the most successful of the lot.

ON THE OTHER HAND

The InfoCorp report isn't all wine and roses. It frankly points out that Equity is "nothing new." The systems are straight clones of the IBM PC, and clones have been around since shortly after the original PC introduction in August 1981. InfoCorp also points out that "if Epson is following the Compaq formula for success, it has ignored one aspect: make it the same but better."

The InfoCorp report also notes that Epson's superior reputation for printers has not been transferred to computers, a market where the company simply "has not proved itself." The report makes the typical analogy of a printer being like a toaster — a one-function appliance — while a computer can be so helpful as to be "an extension of the self." Can you buy status from Sunbeam?

Ultimately, it's a question of shelf space, the report says. Are the Equity's advantages enough "to entice the dealer to drop another product line in order to stock Equity?"

The answer to this question may depend on another manufacturer of inexpensive MS-DOS systems, Fort Worth, Texas-based Tandy Corp., which sells its products exclusively in its own Radio Shack outlets. Tandy now has a full line of IBM PC compatibles in addition to its famed TRS-DOS systems. Tandy claims that it will even surpass fellow Lone Star Stater Compaq in units sold this year. Such success if achieved will cause free market forces to demand shelf space for the Equity, a true competitor to the Tandy MS-DOS line.

Head 'em up! Move'em out! ●

VALDOCS 2+ CONTROL KEYS

Here's a few control key functions for use with Valdocs 2+ that are making the rounds. Maybe you know about them already, but if not, you'll no doubt be interested.

Some block functions can be accomplished without having to chase around the block menus. For example, it is possible to mark and delete blocks of text with the following control keys:

Block Mark: CTRL-MAR REL marks the begining or end of a block. Be sure that you only mark two places on your text for block moves, deletes and copies.

Block Delete (Recoverable with UNDO): CTRL-DELETE deletes a marked block of text that can be recovered by use of the UNDO key.

Block Delete (Gone forever): CTRL-SHIFT-DELETE permanently deletes a block of text.

Blocks of text can be moved around your text document using the following procedure:

1. Mark the block of text to be removed using either the CTRL-MAR REL key or the Block Menu, activated by typing CTRL-b.

2. Delete this block either by typing CTRL-DELETE or by use of the Block Menu.

3. Move the cursor to the target area in your text.

4. Press the UNDO key or CTRL-UNDO. The UNDO key will place the text and block markers in the new location; CTRL-UNDO strips block markers and clears the internal Valdocs stack.

Several other features are accessible by way of control keys.

The time and date can be alternated by typing a CTRL-CTRL (press both control keys at the same time).

The motors on your floppy disks can be started by typing CTRL-CPYD. You are more assured of proper disk seating if disks are changed with the motors running. If you have trouble with disks not working right the first time you insert them, try this.

The Valdocs editor can be switched to the draft mode (for faster operation in newer Valdocs 2+ releases only) by typing CTRL-EDIT. Normal editor operation is restored by typing CTRL-Z.

Photographing Your Screen

Have you ever wanted to take a picture of your computer screen for use at club meetings, school or work? Screen photos are not difficult to take, but you'll need a tripod, a 35mm camera with manual or extended exposure automatic modes and preferably a 105mm (or longer) lens to do a professional job.

Full-screen shots require more attention than ordinary photography because of exposure problems and potential distortion. Characters on the screen are made up of pinpoints of light surounded by black, causing most light metering systems to give false readings. To compound the problem, video screens are scanned (from top to bottom and left to right), and so the screens actually flicker on and off, somewhere between 20 and 30 times a second.

Slow phosphers in the CRT and eye physiology prevent us from seeing the flicker most of the time, but your film can and does see it; this is what causes the horizontal bar that you may have seen in pictures taken with a television set in the background.

The following is a set of easy-to-follow rules that will give good presentation quality screen photographs.

Rule 1: Choose a film with ASA speed rating of 100 or more. You may use either black-and-white film such as Plus-X, slide film such as Ektachrome 100, or a color negative film. Color films should be of the outdoors variety.

Rule 2: Use a 105mm or longer lens when taking full-screen photographs. The normal 55mm lens must be placed so close to the screen to fill the frame that "barrel" distortion occurs. (This distortion curves the outside edges of the image, and is particularly noticable in screen photos.) For best results, use a lens of the macro variety. Zoom lenses can be used, but may produce ghosts or halos; fixed focal length lenses are best.

Rule 3: Set up your camera on a tripod and use a cable release. Your exposures will be too long for handheld shooting.

Rule 4: Darken the room as much as possible before taking a picture. Make sure no reflections are visible on the screen. Turn the brightness on the QX-10 monitor as bright as possible without showing the background raster or distorting the image.

Rule 5: Carefully align and focus your camera so that it is absolutely square with the screen. This setup is easier if you tape a piece of paper to the screen and align it with the view finder edges.

Rule 6: Set your exposure. Use a shutter speed of ½ second or longer; longer shutter speeds are desirable to eliminate any trace of the horizontal bar often seen in CRT photos. Set the lens opening to expose your film properly.

The best way to set your exposure is to display a screen with a fine graphics "checkerboard" pattern. Such patterns can be drawn by simple BASIC programs. Once the pattern is on the screen, meter the screen in the normal manner to obtain a starting exposure. The reading will have to be corrected somewhat to compensate for film

Text continues on page 56

EQUITY

There are a lot of good things to say about Epson's PC-DOS alternative. But marketing may be as important as manufacturing.

By Roger Strukhoff

If you can't beat 'em, join 'em. That seems to be the view of Epson America, which after three years of struggling with its HX, PX, and QX microcomputers, finally quit fighting the current and got on the Big Blue boat. The result is Equity, a line of three MS-DOS micros that combine substantial IBM PC compatibility with substantial savings on the price tag. With the move, Epson has dropped the QX line entirely, but continues to manufacture its HX-20 and PX-8 laptop systems.

The three Equity systems are positioned respectively against the IBM PC, PC XT and PC AT. Equity I was released in late 1985; Equity II and III have been available since the middle of March.

The Equity I is an Intel 8088-based system, as are the IBM PC and XT. The Equity II runs a NEC V30, a microprocessor that's compatible with the Intel 8086 found on many PC-compatibles. The 8086 and V30 have a 16-bit bus, compared to the 8088's 8-bit data path. With Equity II, the V30 can run at either 4.77 or 7.16 megahertz (MHz). The Equity III has an Intel 80286, the microprocessor used by the IBM PC AT. Note the Equity III can run at either 6 or 8 MHz, while the IBM PC AT must do with 6 MHz.

The bottom-of-the-line Equity I — no monitor, one drive, 128K RAM — lists at $995, breaking the magical $1,000 barrier to get people's attention. Add a monitor, a second disk drive, and boost the RAM to 256K to get a reasonable system, and the price is still a reasonable $1.495.

> Equity does not need to use an expansion slot for more memory.

Up and down the line, Equity comes in about 40 percent below IBM prices. They're even significantly below infamous IBM "gray market" prices. (See page 30 for Equity pricing.) Add to this the fact that the Equity is smaller, has a nicer keyboard and a better monitor, and one can see the appeal.

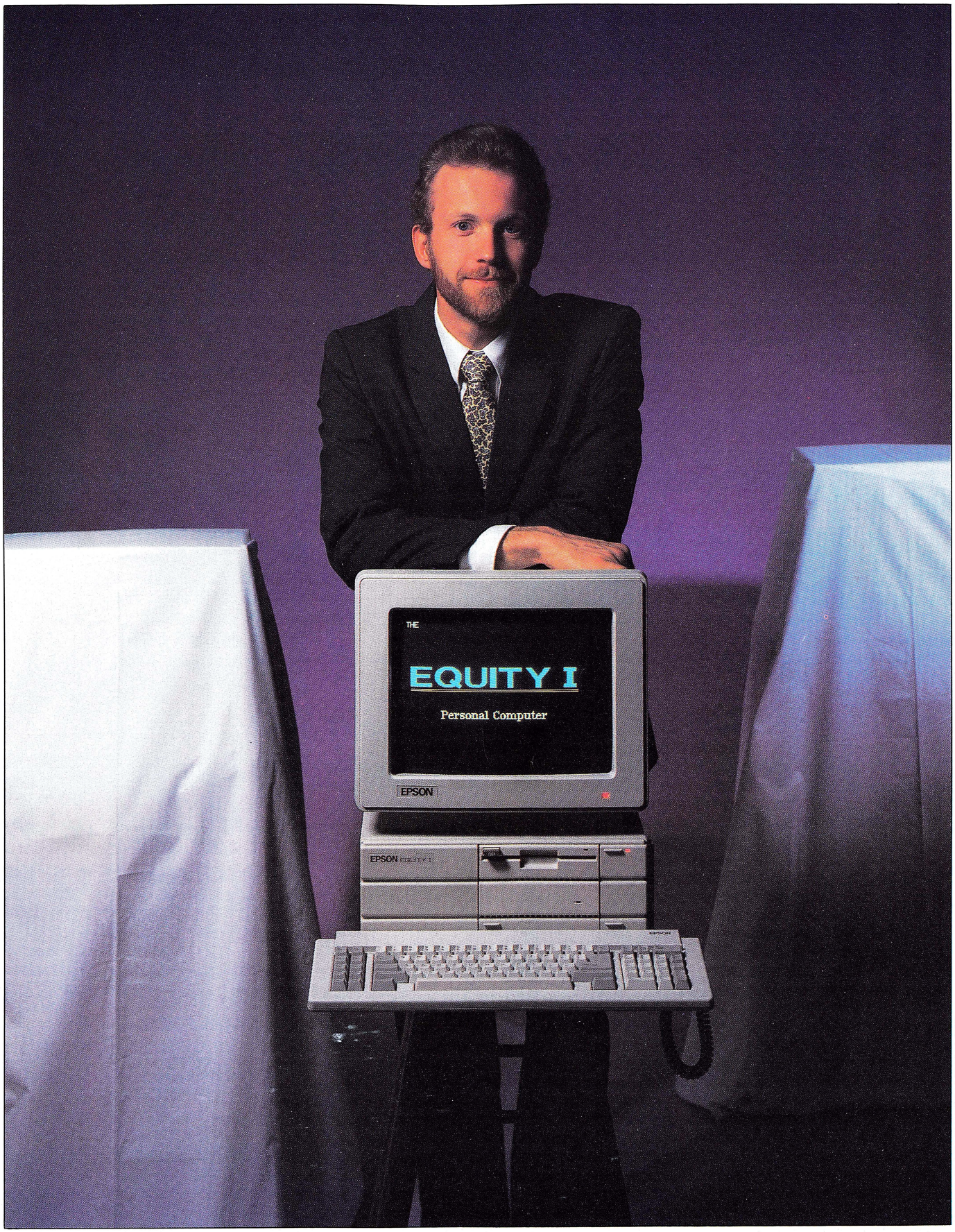
On the down side, consider the following: the first micro in this line, the Equity I, was introduced in the fall of last year, more than *four years* after the IBM PC changed the microcomputing world. Add to that the fact that Epson is hardly the only company to take the lowball approach to IBM PC comptabiles or "clones," and it becomes clear that Epson has a rough task facing it.

Leading Edge has received raves throughout the trade press for its inexpensive PC clone, the Model D. The company is poised to grab a big share of the market with its system, Leading Edge has also recently released an AT-compatible system.

Kaypro, which has had amazing success with its klunky, inexpensive and reliable CP/M systems, has just come out with a low-priced MS-DOS system, the Professional.

Tandy Corp. goes one better, matching Epson's strategy of offering an entire line, with its 1000-1200-3000 series. Tandy has had its computers available for about a year longer than Epson, and has its well-known, incredibly large Radio Shack distribution network to get them in people's hands. Tandy also has Bill Bixby and some ornery executives who are determined to make their company the number one PC-compatible manufacturer.

Speaking of number one in compatibles, Compaq hasn't sat on its hands, either. Although Compaq will never win a price war, its reputation for building a better box has been earned through successive PC- and AT-compatible triumphs. The company is now generating favorable gossip



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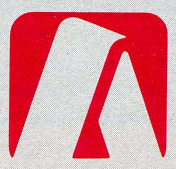

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with its new, slimmed-down Portable II 80286-based micro. Compaq went from a concept to a Fortune 500 company faster than anyone in history (yes, including Apple), and shows no signs of slacking off.

Then there are the other compatible manufacturers: AT&T, ITT, Zenith (which continues to get fat off the federal government), Hewlett-Packard, and the many "plain vanilla" bottom-basement priced compatibles found for sale in big, ugly ads throughout the trade books.

One market research company, Cupertino, Calif.-based Infocorp, is generally positive about the Equity's chances. But Infocorp points out the problems of competing in a crowded market (see story in the News department).

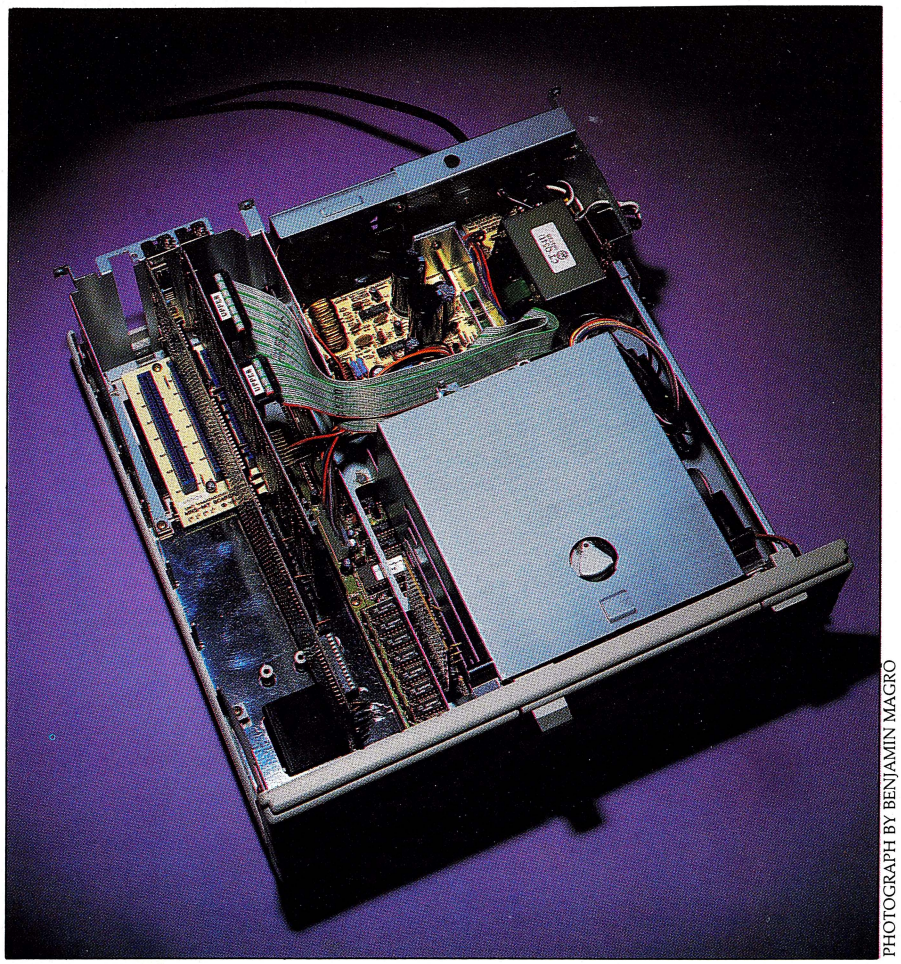
Epson used an international strategy in developing the Equity. Specifications for the computer were developed jointly in the United States by engineers at Epson America in Torrance, California, and the company's Advanced Products Development (ADP) group in the Silicon Valley area of northern California. Circuit boards are designed and manufactured in Japan, disk drives were specified by Epson and come from a number of sources, while the monitors are made in South Korea.

THE SPECS

Specifications for the three Equity machines are shown in Table 1. One thing to note is that the Equity I comes with only three expansion slots, all full size, and one is taken by the video adapter card. Another one is taken with a hard disk system.

To its advantage, the Equity does not need to use an expansion slot for more memory; there are spaces on the motherboard for RAM chips. Also, a floppy drive does not need a slot, as it does on the IBM PC. (The disadvantage to the latter approach is that if the floppy drive circuit blows, you can't just plug another in; the motherboard itself needs to be fixed, so it's back to the factory.) Most important, Equity comes with parallel and serial ports installed. Just plug your printer or modem in, and off you go.

Equity II comes with five slots, all full size. The Equity III has eight expansion slots, six for 16-bit bus applications and two for 8-bit applications.



PHOTOGRAPH BY BENJAMIN MAGRO

The Equity's motherboard is buried under the rest of the system's electronics, power supply and drives. The "dealer-unfriendly" design results in a small footprint.

The Equity I's 53-watt power supply is at the lower end of the range, but still substantially larger than the IBM PC's 40-watt juice unit. The main concern with the power supply is when a power-hungry board is plugged in. The hard card on a disk, a hot new fad, is a classic example of a power-guzzling board. Time will tell if the Equity I's power supply is equal to the task, assuming that many users choose this peripheral in the first place. The Equity II and III have more ample, 100- and 200-watt power supplies, respectively.

The price of memory is still falling quicker than the price of oil. This is reflected in 256K standard RAM with Equity I, and 640K standard with Equity II and III. This is not astounding by today's standards, but we've come a long way since the 64K RAM days of the first IBM PCs. All Equity motherboards accommodate a maximum of 640K of RAM.

The III's memory can be expanded to 15.5 megabytes with expansion cards. With the advent of the Lotus-Intel-Microsoft expanded memory specification, this is critical to anyone laying out the bucks for an AT-type system.

The Equity II can be equipped with a 1.2-megabyte floppy, with the larger floppy standard on the III. The jury's still out on the value of the high-capacity floppies, since the MS-DOS world ran on 360K for so long. But it's there if you want it.

All Equity systems can be equipped by Epson with hard disks. A 20-megabyte version is available for the I and II, while the III will take either the 20-megabyte disk or a 40-megabyte version.

TINY FOOTPRINTS

The Equity I and II are positively dainty, and the III is no desk hog, all things considered. The I and II each have a 14.5 by 15-inch CPU footprint, compared to the IBM PC's 15.5 by 19.25, and weigh only 24.3 and 25

pounds, respectively. It's too much to call the I and II cute, but they they fit into tight spots quite nicely. The III takes up 21 by 17.5 inches, about 30 percent less than the AT.

One thing to consider: the IBM PC is a big clunk, but it can take a lickin' and keep on tickin'. Not to say the Equity can't, but the IBM PC is practically impossible to destroy, while smaller systems like those from Tandy, Leading Edge, and Epson look like they wouldn't last the day with an average five-year-old. But as long as the Equity is used by responsible adults who won't throw it against the wall, this is probably a minor consideration.

KEYING IN

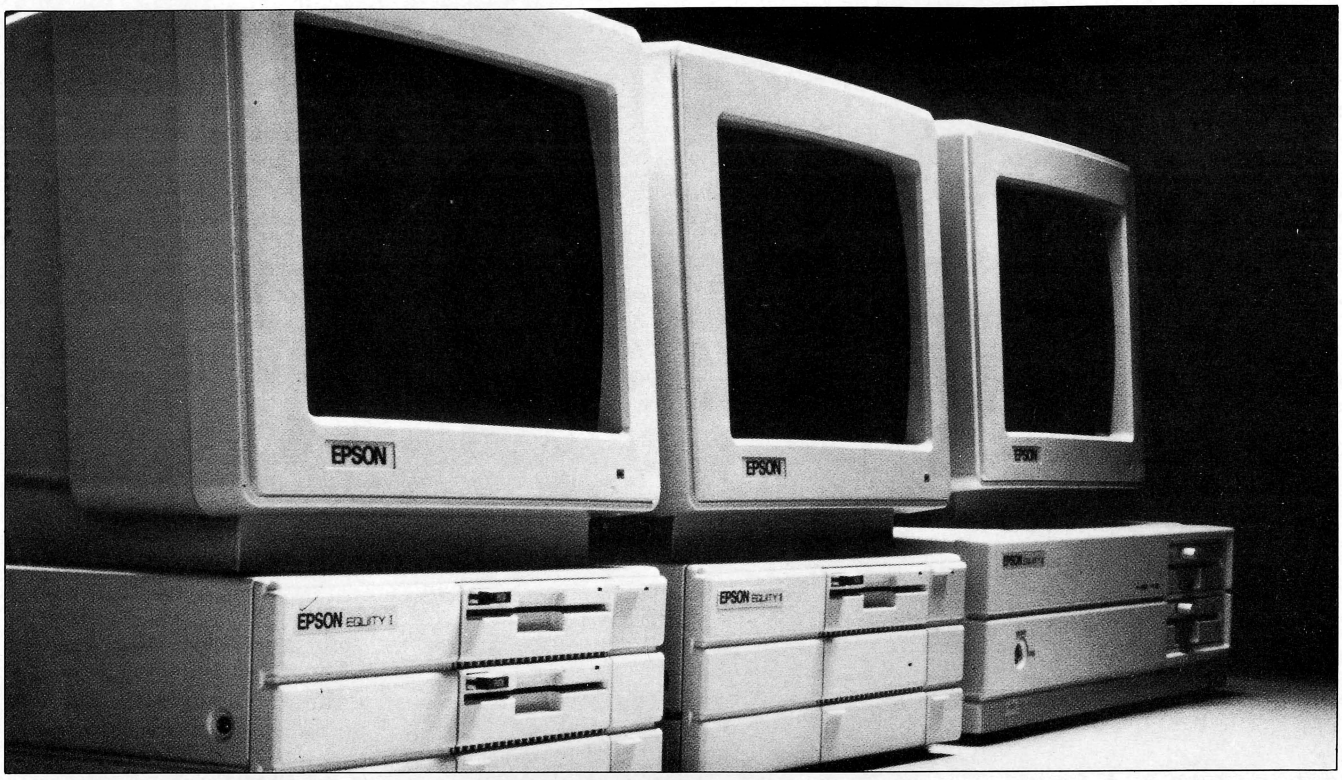
The Equity keyboards are all alike, and take up 18.6 by 7 inches. The keyboard is one of the nicest things about the Equity, and this in an industry dominated by a company who built the world's greatest typewriter keyboard then caught an incurable case of amnesia when it started to build microcomputers.

On the Epson keyboard, you can find the return (enter) key, you won't accidently hit the alt or caps lock every three seconds, escape is easy to find yet isolated from the main keyboard, and the function keys are at the left and fit templates designed for the IBM PC. Num lock, break, home, end, page up and down, insert and delete, and that wonderful invention, the print screen key, are all part of the right-hand rank of keys, isolated from the main manual but easily accessible nevertheless.

There is an embedded numeric keyboard, and the cursor arrow keys

Table 1. The particulars of Equity.

Item	Equity I	Equity II	Equity III
CPU	Intel 8088 8087 optional	NEC V30 8087 optional	Intel 80286 80287 optional
Speed	4.77 MHz	4.77 or 7.16 MHz	6 or 8 MHz
Bus	8-bit	16-bit	16-bit
Address	20-bit	20-bit	24-bit
Standard RAM	256K	640K	640K
Maximum RAM	640K	640K	15.5MB
ROM	16K	16K (64K max)	32K
Expansion slots	three full-size	five full-size	eight six 16-bit two 8-bit
Software	MS-DOS 2.11 GWBASIC Xtree w/hard disk	MS-DOS 3.1 GWBASIC Xtree w/hard disk	MS-DOS 3.1 GWBASIC Xtree w/hard disk
Interfaces	serial, parallel	serial, parallel	serial, parallel
Power supply	53-watt	100-watt	200-watt
Storage	two drives max 5.25-inch floppy (360K) 20MB hard disk	two drives max 5.25-inch floppy (360K or 1.2MB) 20MB hard disk	four drives max 5.25-inch floppy (360K or 1.2MB) (360K or 1.2MB) 20MB hard disk 40MB hard disk
Size (in.)	14.5 x 15 x 5.75	14.5 x 15 x 5.75	21.1 x 17.5 x 6.25
Weight	24.3 lbs.	25 lbs.	33 lbs.



All in a row. Equity I has been available since late in 1985. The II and III were made available during the middle of March this year. The systems compete directly against the IBM PC, XT, and AT.

follow the pattern of those on the AT. (There is no standard arrow format for microcomputers, but this seems to be a small point. Think of a four-speed car transmission; at first you can't find reverse, but you eventually locate it automatically.)

Another nice touch is having the on-off switch on the front of the machine, where you can find it. The reset button is also on the front, tucked right below the lower drive with 10 DIP switches. A pull-down drawer opens to reveal the button and switches, and there's a chart on the drawer that tells you how to set the switches. The DIP switches must be set to accommodate varying RAM, monitors, and port access.

PHILOSOPHY

Inside the Equity, the motherboard is tucked underneath everything else; the disk drives, the power supply and the fan. This accounts for Equity's tiny footprint, but it makes it a real problem to work on the motherboard itself. In fact, just getting into the Equity is not easy. You must remove seven screws — compared to three for the IBM PC and two for the Tandy 2000 — and some fussy casing to get inside.

Is someone trying to tell us something? Perhaps. Epson, with the QX-10 and its Valdocs operating system and HASCI interface, produced the friendliest computer ever made. Forget the number of sales (between 35,000 and 50,000 with a strong suspicion here of the lower figure). HASCI and Valdocs are historically significant as an effort to bring computer power to the people; not hackers, but people who just wanted life to be a little easier.

> The Equity I and II are positively dainty.

This philosophy seems to have been followed, perhaps unwittingly, with Equity. The lack of expansion slots and relatively inaccessible motherboard won't bother someone who doesn't want to "learn computers." With a hard disk and color monitor, many users won't need more than one more slot. A modem doesn't necessarily need one, so what else is there? With the plethora of multi-function cards today, most needs can probably be satisfied.

Epson, with the QX-10, found a market of single-purchase users who worked at home or independently in an office but didn't want to learn a lot about computers. This is the same crowd Apple is after with the Macintosh, but Apple has always tried to be hip, "with it." Epson's market is not so much "with it" as not worried about being without it.

A NICE TOUCH

All Equity systems come with Microsoft's GWBASIC, and nice GWBASIC and MS-DOS documentation. Hard-disk systems also come bundled with a *neat* file management program, Xtree, written by Executive Systems, Inc. Xtree has been extolled in many computer publications, and rightfully so. It shows the directories and sub-directories on a hard disk at a glance, with files listed in "ASCIIbetical" order on the same screen. File and directory sizes are listed, and many DOS commands can be accomplished with simplified commands directly from Xtree. Admittedly, the DOS commands run much slower from Xtree, but in many cases the wait is not annoying when the convenience is considered.

Xtree is a trusted friend for hard disk management, and it was darn

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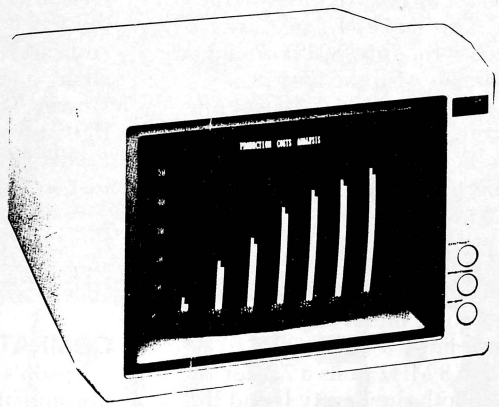

COLOR MONITOR 179.95

Epson's Comrex 6600 Medium Res RGB monitor for QX-16. Retail price is 399.95. Now just 179.95. Also Hi Res Comrex 6700, was 499.95 now 329.95. Both the above require QX-16 Color Adaptor Cable SDYA-1 for 29.95 and DO NOT work in the Valdocs or CPM mode; they only work in the IBM/MS-DOS mode (Lotus, games). Please add 9.00 for shipping in US.

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Equity Price List

Equity I

Configuration A: single 360K floppy drive, 256K RAM: — $995
- with mono monitor: — $1,273
- with RGB monitor: — $1,693
- mono and 512K: — $1,442
- RGB and 512K: — $1,862

Configuration B: dual 360K floppies, 256K RAM: — $1,295
- with mono monitor: — $1,573
- with RGB monitor: — $1,993
- mono and 512K: — $1,742
- RGB and 512K: — $2,162

Configuration C: single floppy, 20-meg hard disk, 256K RAM: — $2,195
- with mono monitor: — $2,473
- with RGB monitor: — $2,893
- mono and 512K: — $2,642
- RGB and 512K: — $3,062

Equity II

Configuration A: single 360K floppy, 640K RAM: — $1,695
- with mono monitor: — $1,844
- with RGB monitor: — $2,244

Configuration B: single 360K floppy, 20-meg hard disk, 640K: — $2,895
- with mono monitor: — $3,044
- with RGB monitor: — $3,444

Equity III

Configuration A: single 1.2-meg floppy, 640K RAM: $3,195
- with mono monitor: — $3,473
- with RGB monitor: — $3,893

Configuration B: single 1.2-meg floppy, 20-meg hard disk, 640K: $4,195
- with mono monitor: — $4,473
- with RGB monitor: — $4,893

thoughtful of Epson to provide it as part of the Equity package.

HOW FAST MY WISHES RUN

Norton's Speed Index utility rates the Equity I at 1.0, the speed of the IBM PC. This makes sense, since Equity uses the Intel 8088 running at 4.77 MHz found in the IBM PC. Actually, Equity is a tick slower off the starting line because its modified BIOS (which keeps it from being sued by IBM) must work a little longer to get things started.

This utility indicates a speed factor of 1.7 for the NEC V30 microprocessor. Equity III can be expected to be much faster than its smaller siblings; a Tandy 3000 running at 8 MHz pulls a 7.3, for example. Both the Equity II and III will be quicker than their IBM compatriots.

The subject of clock speed and the AT has generated some good gossip and controversy. The AT will in fact run at the higher speed, if the user finds crystals not sanctioned by IBM. Big Blue for its part has issued dire warnings of synchronicity problems with some software if the AT is made to run too fast. Most AT clone manufacturers set their machines at a speed higher than the AT, automatically creating the selling point of producing a faster system.

Bill Howey, who has been testing all the Equity systems for Epson, says there are no software problems with a faster system. "I think IBM is trying to set (other manufacturers) up with the slower system," he says. Howie reasons that IBM wanted to create the 6 MHz system as a standard, then release a faster system of its own, thereby crippling everyone else. In any case, other manufacturers have all gone to faster systems. Says Howey, "there's a switch on Equity III to alternate between 6 and 8 MHz. Frankly, I don't see the need for it. I'd just set it to 8, then go to work."

Actually, Epson's first 3,000 Equity III's ran at only 6 MHz. The second shipment, 10,000 units, all have the switch.

COMPATIBILITY

Epson's Bill Howey furnished lists of compatible programs shortly after Equity's introduction last fall. (Epson Connection readers will remember this.) But he now says he has found nothing that won't run on Equity. That is to say, there are the same compatibility problems with the III found on the AT, but many software developers are writing 80286 versions of their programs. Howie notes that programs written for 1.x versions of MS-DOS will have trouble on the II and III, but there's not much to be done about that. He adds that he has been running PC-DOS on Equity systems without a hitch.

The Equity I comes with MS-DOS 2.11, the II and III with more high-powered 3.1. Software said to run with these respective versions should have no problems with Equity systems.

The Epson monochrome monitor is a 12-inch model with a "high-persistence, green P-39 phosphor screen." The 13-inch color (RGB) monitor works from a base of 16 colors. Both provide a good picture.

Equity product manager Bob Anderson points out that "monitors are sold separately from the Equity computer. Users have a choice of most other monochrome, RGB or composite video monitors on the market as well as ours." For users who want really high-quality graphics monitors, driven by the likes of a Hercules or IBM enhanced graphics card, Anderson points out that any of the expansion slots on all the Equity systems can be used for this purpose.

CLOSE THE SHOP

If all life is in reality nothing but an illusion, then Equity may be a quintessential real-world challenge to Epson. The company's image will be critical in the success of its MS-DOS micros.

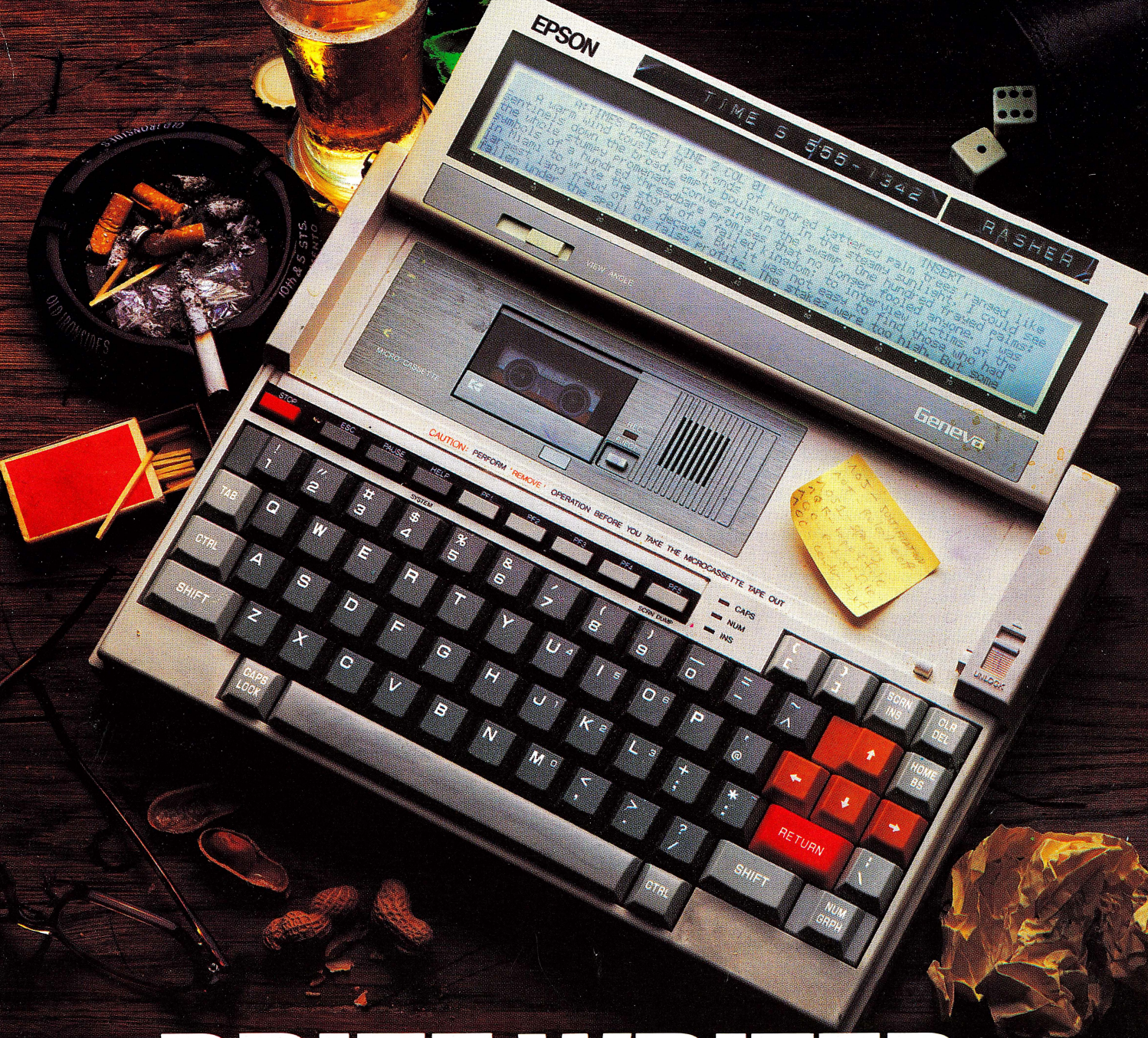
The paper devoted in trade magazines to trashing the QX-10 and Valdocs — based mostly on the system's glacial speed — put warm food in the bellies of many a logger's family. The QX-16 favored hardly better, and the number of units sold could be in the hundreds.

Epson's decision to stop supporting the QX machines was abrupt and final. QX users are finding no help from the company in which they invested, and they are most definitely not happy about that situation.

Can Epson overcome this lackluster reputation?

Perhaps the company's overall image is not so bad. Certainly, Epson printers have achieved enormous popularity, because of their price, range of capabilities and dependability. Epson is counting on this reputation to carry the day with Equity. Epson printers are carried by about 4,000 dealers. Epson is pushing hard to get them to carry Equity, and has succeeded in at least a quarter of them to date.

This is an age of marketing. With Equity, Epson offers a good byte for the buck, but so do a lot of people today. The medium is the message, and Epson must work to get its message across. ●



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UPDATING YOUR QX-10 FOR MS-DOS

A must? A maybe? Or forget it?

By Paul R. Rothweiler

Prior to the long-delayed arrival of Valdocs 2 and the new Val+ with its updates, many QX-10 owners bought or considered buying Titan QX-PC boards that would open up the world of MS-DOS software to them. Doing so would augment, if not replace, their Valdocs 1+ programs.

Six months after the arrival of Val+, Titan Industries is no longer manufacturing QX-PC boards; a decision that's not hard to understand in view of the end to QX-10 production last year. But there seem to be plenty of MS-DOS boards available — and at cut-rate prices.

The question is, will it benefit QX-10 owners to seek IBM PC compatibility by grabbing a QX-PC while they still can? In many cases it will, especially since one can now get 512K with twice the RAM of a QX-10 motherboard for less than $600.

In spite of the dramatic improvement of the Valdocs product, a good case can be still be made for a QX-PC since Val+ cannot be expected to offer all things to all users. Regardless of the loyalty of Rising Star to the QX-10 and -16 owners, few pieces of new software are being written for CP/M these days.

Are you one who should embrace IBMism? Do you need MS-DOS software? Just how well does the Titan Board perform? Does it bring up all or a great percentage of MS-DOS programs? How much RAM do you need on your Titan Board?

Titan Industries made the QX-10 a more accessible system with its QX-PC board, providing MS-DOS capability. Although the board has been discontinued, there are a number available from numerous sources. It's an inexpensive introduction to the present industry standard.

NO PAT ANSWERS

Answers to these questions are important. But because not all QX-10 owners have the same software requirements, there's no easy answer to the question of the board's value. The value of MS-DOS compatibility depends solely on your needs, or perhaps your quest to explore new worlds.

Here's a question for you if you're on the fence: Could you buy an IBM PC or compatible system for the price of a Titan Board? Even with computer prices falling through the cellar, you can't. The QX-10 without a Titan Board may be perfectly adequate for you if you have no curiosity about computing outside Valdocs, or you're 100 percent satisfied with what has become a really fine and integrated Val+ system.

Still, there are hundreds of new programs available in the world of the IBM PC, and they can do everything from teaching you how to type; to helping with cooking, reading or gardening; to unerasing files you eradicated by accident; to creating artistic greeting cards or family newsletters.

Even if you have an insatiable sense of curiosity and like to poke your nose into computer programs, you don't need MS-DOS compatibility in order to satisfy yourself. CP/M has a huge library of software — and the best thing is that most of it is free. It's as accessible as your local user's group.

This is not to say there's any

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and tables of contents are WordPerfect, PerfectWriter, PractiWord and the Professional Writers Package from Emerging Technology in Boulder, Colorado. All of them run perfectly on 256K QX-PCs.

If you're looking for games like Flight Simulator, though, you won't be able to run them on a Titan co-processor. Sargon III will run fine on the QX-PC, but games relying mainly on the IBM graphics capabilities will not run at all, because the QX-PC has no IBM graphics card or simulator.

Titan also has software that will let QX-PCs use most of the RAM in the motherboard of the QX-10 as a RAM disk (170K), and that's a boon for QX-PC owners.

Included in Table 1 is a list of prominent MS-DOS software and their versions that will run on the QX-PC. It in no way represents an effort to list every MS-DOS program that will run with the Titan Board.

You can see there are many new worlds to conquer in the MS-DOS universe. If there are challenges here you want to meet, the Titan Board is an inexpensive way to do so. But go into the MS-DOS quest with your eyes open. You don't want to get gunned down your first time out. ●

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guarantee that you'll be satisfied with it, since most if it is "old" and there are better ways of doing things now. There are thousands of geniuses in Silicon Valley and elsewhere devising even newer and better ways of accomplishing old tasks, while discovering more and more tasks that can be done faster and better with computers.

Are you missing out on an experience because you can't run MS-DOS software? Consider the following: Would you like to try out Ashton-Tate's new dBase III Plus? dBase II has been improved upon; dBase III gives on-screen Help to keep you from being mesmerized by the dot prompt and is a different program that's far easier to learn.

Would you like to adopt as an indispensable computer help Borland's now-famous desk organizer, SideKick? SideKick, which can open a window in the middle of a spreadsheet or word processing document that will let you jot down something important? Of offer you that phone number you suddenly need from a directory — even dial the number for you, if you have a modem?

Or how about Framework II, the best integrated program in the MS-DOS world? Does it interest you? Or WordStar 2000, WordPerfect, or any of a dozen other new programs that offer you an incredible variety of features? You can't get them anywhere but among the program stars of the PC universe.

WHAT RUNS, WHAT DOESN'T?

Just how IBM-compatible is the Titan Board? Well, sometimes it depends on what version of the software you're buying.

In general, the Titan QX-PC will run most IBM programs, including, but not limited to, most major word-processing, spreadsheet and database programs. Among them are WS 2000, Microsoft Word, WordPerfect, pfs:Write, and certain versions of dBase III, Lotus 1-2-3 and Framework. But different releases of the same product may not run due to changes in the software; often changes caused solely by copy protection schemes designed to prevent unauthorized duplication of the programs.

Ashton-Tate's dBase III and Framework (versions 1.0) perform well on the Titan Board, but the new versions of both programs will not run at all. You can, however, run either of them by buying a copy-breaking program that strips the protective code from the program. Lotus 1-2-3, Release 2, won't run even after having its copy protection stripped! It's the same story with Symphony 1.1.

An MS-DOS Sampler for the QX-PC

Program	Version
Bellsoft Desket	1985
Dac-Easy Word	1.0
dBase III	1.0
Electric Desk	1.04
Framework	1.0
Friday!	1.0
Hayden Speller	1983
MathPlan	2.0
Micro Cookbook	1984
Microsoft Word	1, 2
New Word	2.14
Norton Utilities	3.0
Offix	1.11
Ortho Computerized Gardening	1984
PC Calculator Plus	2.01
PC Deskmates	1.0
PC-Calc	2.0
PC-File/R	1.0
PC-Type	2.0
PerfectCalc	2.0
PerfectFiler	2.0
PerfectWriter	2.0
PFS:File	1984
PFS:Plan	1984
PFS:Proof	1984
PFS:Report	1984
PFS:Write	1985 C
PolyTron's PolyWindows	July 1985
PractiBase	1.01A
PractiWord	1.04
PWP Edix, Wordix, Index, Spellix (Professional Writers Package)	4.02, 3.0
Sidekick	1.52A
Sargon III	1985
Spellbinder	5.2
Superkey	1.0
Textra	3.1A
The Word Plus	1.2
Timeworks SwiftCalc w/Sideways	1985
Timeworks Word Writer	1984
Timeworks Electronic Checkbook	1984
Timeworks SwiftTax	1984
WordPerfect	4.0
WordStar	3.3
WordStar 2000 Plus	1.1
WS CorrectStar	3.32

Desk organizers, the latest development in the microcomputer world, are typical of the immensely valuable programs you can run with a Titan Board. Organizers will do a variety of things for you while you're working. Aside from the note pad, phone directory and dialer, they can give you a calendar to keep appointments straight, and a calculator to do some figuring, set alarms to remind you of things you have to do, keep track of business expenses — you name it.

The most popular desk organizers, including SideKick, run efficiently on the QX-PC in their 1985 versions. That does not, of course, assure that a 1986 release will run, so it behooves you to check out the software before you purchase it. If a dealer won't let you try it out on your Titan Board or guarantee you a refund if it won't run, find another dealer.

If you want a feature that Valdocs doesn't yet own — such as the ability to generate outlines, indexes or tables of contents, or write multiple columns of text on your screen or at the printer — you can get them in the MS-DOS world, and more than likely they'll perform well on the Titan Board. Some of the programs that currently offer outlining, indexing and tables of contents are WordPerfect, PerfectWriter, PractiWord and the Professional Writers Package from Emerging Technology in Boulder, Colorado. All of them run perfectly on 256K QX-PCs.

If you're looking for games like Flight Simulator, though, you won't be able to run them on a Titan co-processor. Sargon III will run fine on the QX-PC, but games relying mainly on the IBM graphics capabilities will not run at all, because the QX-PC has no IBM graphics card or simulator.

Titan also has software that will let QX-PCs use most of the RAM in the motherboard of the QX-10 as a RAM disk (170K), and that's a boon for QX-PC owners.

Included in Table 1 is a list of prominent MS-DOS software and their versions that will run on the QX-PC. It in no way represents an effort to list every MS-DOS program that will run with the Titan Board.

You can see there are many new worlds to conquer in the MS-DOS universe. If there are challenges here you want to meet, the Titan Board is an inexpensive way to do so. But go into the MS-DOS quest with your eyes open. You don't want to get gunned down your first time out. ●

RSI president Gale Carr is counting on the latest releases of Valdocs to take some pressure off the company.

VAL?

The completion of Valdocs remains backstage as the crowd grows ever restless.

By Roger Strukhoff

It's hard to get more than two people to agree on anything, but in the sub-culture of Valdocs, all adhere to two opinions: 1. Valdocs is great, 2. Valdocs is late.

Rising Star Industries, unleashed by Epson in 1985, announced Valdocs+ last fall, and has been proclaiming its diligence in completing the Valdocs project ever since. Epson QX owners, having shown incredible patience, are starting to doubt RSI's ability to get the job done. One influential group, the National Epson QX-10 Users Group, headed by Richard Shoemaker, has gone so far as to announce a boycott of RSI.

BIBLICAL PROPORTIONS

Surely, if the QX owner feels like Job right now, then Valdocs developer Chris Rutkowski, new RSI president Gale Carr and the remaining staff at RSI must feel like so many Noahs ... without the ark.

Rutkowski has passionately defended his product and his company, recently dropping a lengthy message on the EpsonLine special interest group, which is accessible through CompuServe. Major excerpts of Rutkowski's February message accompany this story.

In this message, Rutkowski revealed several facts germane to RSI's future.

One, RSI and Atari are no longer working together on a major implementation for the new Atari 520ST. Rutkowski said this project was prohibitively expensive. He asserted that RSI is continuing a relationship with Atari, however.

More important, Rutkowski acknowledged that RSI is truly a "user-supported company" now. That is, there are no venture capitalists in the background, no funding by corporate partners to develop products, no public stockholders keeping things afloat. RSI's fate depends solely on acceptance of Valdocs.

As such, Rutkowski repeated his company's fall 1985 offer of offering Valdocs+ for $349, with free upgrades until ValDone.

And what of the latest Val developments? At press time, Valdocs 2.03 and Valdocs+ III had not been released, but RSI president Gale Carr said they would be "at any moment."

V2.03 will be the final update to Valdocs 2. Rutkowski said its editor and spreadsheet have been rebuilt out of V+'s "innards," with many features restored that were lost in the transition from Version 1. For example, in 2.03's editor, there is a calculator, page breaks and line spacing on screen, and a linear file store and retrieve option. Its spreadsheet allows empty cells to be calculated as s "0" or "NA," features absolute/partial formula adjustment, and has a compressed file storage option.

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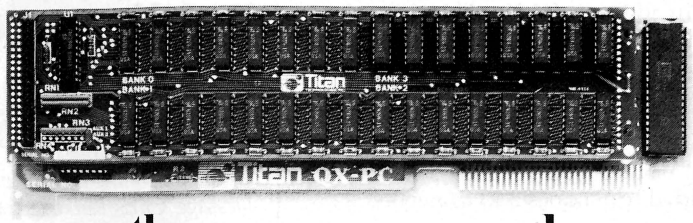

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Math Professor—20 levels of difficulty	50.00	19.95
Underground City—Protect yourself from Flying Aliens	45.00	9.95
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Nutricalc Diet Program, also comes with a chocolate diskette Apple II	145.00	9.95
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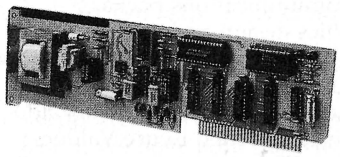
Most Acorn Programs work on the QX-10 only. ☐=QX16 version avb.



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In addition, V2.03 will include the sam DEFKEY, SCHEDULER, COPYDISK and other system modules as are used in Valdocs+.

Rutkowski stresses the upgrade path to V+III modules for V2.03 users. All Valdocs+ plus modules can be added to Valdocs 2.03 as needed.

V=III

A new module in V+III is CPL, or Console Programming Language. Essentially, the module "watches" the user's moves; those moves can be edited later. CPL will automatically load definitions with any program,

Other modules include: a word processor with spell checker, a spreadsheet with business graphics, an automatic checkwriter, a telecommunications package, a graphics design and presentation group, Valpaint, display and printout utilities, and an electronic cardfile. Rutkowski also stresses that Valdocs 2.03 is not needed to use Valdocs+ Version III.

The number to call at Rising Star, located in Torrance, California, is (213) 373-9111. ●

Public statement by Chris Rutkowski.

The following are excerpts from a message Chris Rutkowski in February.

PROPHETS AND PROFITS

Have you ever heard of a self-fulfilling prophecy? It works like this: predict something in such a way that the fact of your prediction causes the event.

No matter how you cut it, both Rising Star and QX-10 users are involved in a self-fulfilling situation.

For example, take a close-knit user community (like QX-10/16 owners), then take a company which depends on that user base for 100 percent of its income (like RSI). Now, prophesize the death of that company. How are the majority of the users going to react to your prediction?

Any sensible person would adopt a "wait and see" attitude, right? "Why should I buy from a company that may not be there tomorrow? I'll wait and see what happens." Catch is, if those people don't buy, the company *will* die. The prophecy fulfills itself.

Rising Star has *zero* income from any source other than the QX-10/16 user base. Similarly, QX owners have no other source of advanced software. We need each other.

If the rumors about the imminent demise of RSI scare you into "wait and see," we both lose. Rumormongers represent the only real threat to the eventual delivery of ValDone.

Decidedly, V+ purchasers have a right to know if they are going to get what they paid for. The answer is yes. V+3 is so close to release that virtually nothing could prevent its completion.

It contains yet another round of *big* improvements: the Dictionary, Calculator, Data Conversion, Slideshow, and many features and details elsewhere. It puts us well past 95 percent of the way to ValDone.

I might add that our current round of layoffs should have little or no impact on either V+3 or ValDone.

The "Atari Project" as some knew of it (in the technical rather than the

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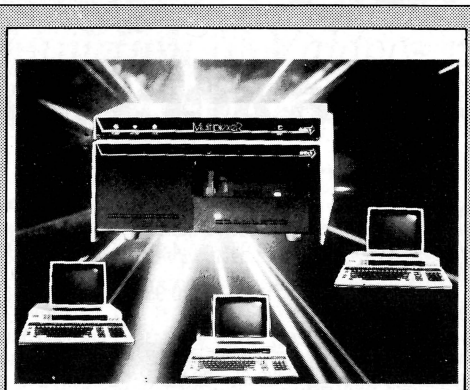

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market/user sense), was really cancelled months ago. That project called for a complete re-write from the ground up of everything. It was going to cost millions for modest improvements. That specific effort has been back-burnered. Meanwhile, we are putting several other Atari products into "main stream" distribution channels. These are *not* "Valdocs for the Atari."

Regardless, the porting of modules to non-QX computers is still very much a part of our plans. Other than that, our plans are proprietary. Details will be revealed when products are announced — not before. I can say that the migration path is *from* the QX-10 *to* other machines. Technically we have struck paydirt, as evidenced by V+1, 2, and 3. I'm just glad we had the luxury of developing Valdocs on such a sweet machine.

As most of you know, until only one year ago we were purely a research and development company. Our *only* job description was to create Valdocs. Putting sales, marketing and service in place has been a difficult undertaking. Much of the difficulty stemmed from the fact that a lot of people got very cultish about RSI. Someone even took a couple of articles I published in Byte magazine describing the HASCI keyboard, and retitled them: "The Valdocs Philosophy."

Well, now we're financed by sales rather than corporate funding. A lot of old faces, whose qualifications were more enthusiasm and willingness than skill and professionalism, are gone. The transition has not always been painless, as the rumor-millers testify. But both the goal and the results have been improved delivery, service and quality for our users.

LET'S MAKE A DEAL

In response to a few user letters, I looked over the pricing. You stop the rumors, get out your checkbook, and buy Valdocs+. You do that and I'll authorize all who call in, within the next 30 days, to receive the the V+ package as it was originally promoted, for $349.00. Nothing more, nothing less. This includes all the V+ software modules and manuals, including Valdraw and Valpaint. It does not include a mouse or any other hardware. It includes updates when ValDone is released. So let's get this show on the road; you forget the rumors and buy the software that supports your investment and I'll get you that software at the original price. It is a bargain by any measure.

To those who say it ought to be free: I almost agree with you. Fact is, that's impossible. Rising Star has employees who must be paid. Someone has to foot the bill. As I said in The Rising Star a couple of issues ago: in the absence of Epson as our mutual benefactor, it is customary for the receiver of the services or goods to bear the expense. (At the same time, I asked for suggestions on how we might get around this. Needless to say, no suggestions were offered.)

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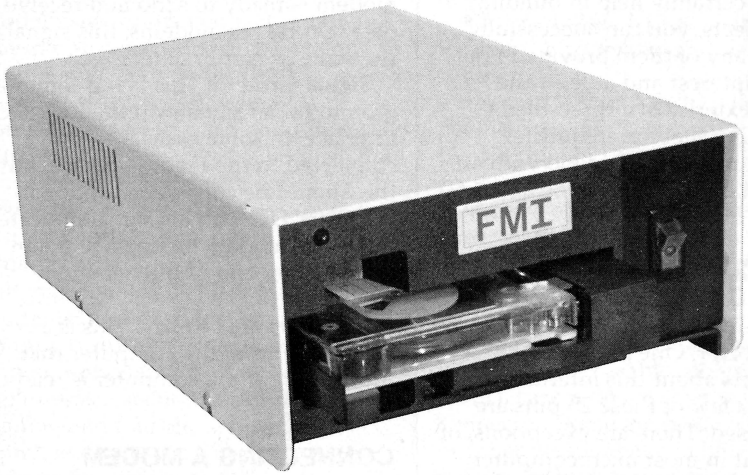

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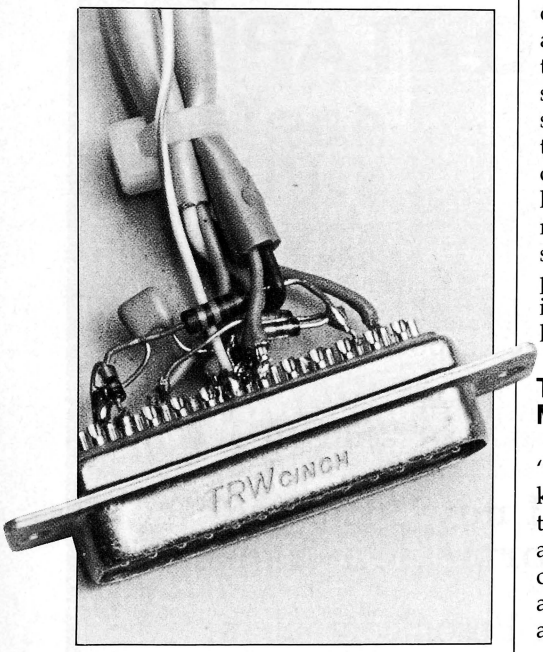
BUILD IT AT HOME

Consider these home projects to enhance your system: a connector and two switch boxes.

By Jim Hansen

Put on your hardhat and read about projects that you can build yourself. The first tells how to make inexpensive modem cables and a general purpose RS-232 switch box, allowing easy switching between two devices connected to your computer. The second project is an "automatic" version of the switch box. It takes a bit more soldering skill, but the rewards are worth it; once it is installed, you can use your mouse and modem without any switching at all. Next month, I'll describe how you can use a cheap ($69 or less) Commodore 64 modem on your QX-10.

If one of these projects is the first hardware project you've considered building, understand this: the absolutely worst thing you can do here is make something that doesn't work. Your only losses will be the time and money invested. The RS-232C interface found in the QX-10 and QX-16 computers is robust and you can short any of the signals found there with no fear of hardware damage. You and your computer are safe from each other.



This photo gives some idea of the packing necessary to include all the automatic switch parts in the computer connector. The extra wire shown leaving the connector provides the "fifth wire" needed for the modem. (I didn't have any five-conductor cable on hand when I built the cable.)

There is no electrical shock hazard on the RS-232C interface itself, and the highest voltage you'll find on this interface is around 9 volts. Even that is current limited to a safe level.

Consider these projects as therapy; they require a different mentality than programming software, doing data entry or other computing activity, and many people build things as a way to recover their sanity. Although reasonable soldering skills will certainly help in building these projects, you can successfully complete any of them provided you have the interest and at least the manual dexterity of a three-toed sloth. Failing these prerequisites, perhaps a neighborhood kid with an interest in electronics will be able to help.

THE RS-232C AND MODEM CABLES

The RS-232C interface uses a 25-pin "D" connector. One of the little-known facts about this interface is that only a few of those 25 pins are actually used. There are exceptions, of course, but in most microcomputer applications only three or four signals are needed or used.

Even less known is what the signals on these pins represent. Table 1 lists the pins that are implemented by Epson's #713 cable, the cable used to connect modems to the QX-10 and QX-16 computers:

Here is a brief description of each of these signals:

Frame Ground: This is the computer equivalent of the green or "third wire" found on electrical appliances. It is meant to blow a fuse if an electrical ground fault occurs and is internally connected to the signal ground, pin 7.

Transmitted Data: The data your computer sends to the outside world.

Received Data: The data coming into your computer from the modem or mouse.

Request to Send: A signal sent from your computer to the device connected to it, requesting permission to send data.

Clear to Send: A signal returned from your peripheral device granting permission to your computer to send data. This signal is always "on" in Hayes modems.

Data Set Ready: A signal sent from your modem that indicates that the modem is ready to send and receive data. On Hayes modems, this signal is the same as carrier detect.

Signal Ground: This is the common ground for all signals on the RS-232C interface. In some cases it is connected to the Frame Ground, but this should be considered optional.

Carrier Detect: This signal indicates when the modem hears the modem on the other end of the telephone line.

Data Terminal Ready: This is a signal sent from the computer that indicates that the computer is ready for service.

CONNECTING A MODEM

Most modem cables run all the lines listed in Table 1 and occasionally other signals as well. Some modem cables (such as those that use flat ribbon cable) include all 25 wires on the connector.

You can make your own modem cable at a substantial savings, if you just copy the #713 cable by connecting all the signals on the pins

shown between two male RS-232 connectors. However, you might first ask yourself if all those wires are really necessary.

The answer is no! Your Epson computer needs only four of these signals (plus a ground) to operate a Hayes modem, and so it is a simple matter to make your own modem cables. Here is a shopping list of what you'll need to make a functional equivalent of Epson's #713 modem cable, which retails for $27.00:

2 - Male RS-232 connectors (Radio Shack 276-1547, $2.99 each)

2 - Hood's (connector covers) (Radio Shack 276-1549, $1.99 each)

5 - (or more) conductor stranded wire, as required. (Avoid "telephone" wire, which is solid and will break if flexed enough. A good choice of wire is Beldon 8444 or equivalent.)

It will take you about 15 minutes and roughly $10 in parts to build this cable. The wiring diagram for it is shown in Figure 1. Here is why it works:

The send and receive data lines on pins 2 and 3, the signal ground line on pin 7, carrier detect on pin 8 and DTR on pin 20 are all connected to the corresponding pins at both ends of the cable.

Request to Send line (pin 4) is connected directly to Clear to Send (pin 5). If the computer ever asks for permission to send something, it will automatically give itself the okay! (This jumper is not necessary on the modem side of the connector, but doesn't hurt anything and lets you interchange ends of the cable.)

Data Set Ready line (pin 6) is connected to both pin 6 and pin 8, the Carrier Detect pin. This is because the Hayes modem internally ties them together, and there is no reason to send the same signal over two separate wires.

It is probable all Hayes-compatible modems (and most others) will be "happy" with this cable, but you may find exceptions. If this happens, check the interface section in your modem manual and find the signals equivalent to those listed above, then change the wiring on the modem end of the cable to match.

You can simplify this cable even further by eliminating the wire between pin 20 of the connectors and replacing it with a jumper between pin 5 and 20 on each end. This eliminates the "hardware reset" capability from your computer, which is sent out by Valdocs mail once in a while. You'll never notice a problem unless you race through some of the mail menus without allowing enough time for the software reset to take place.

Table 1. Epson's #713 cable signals

Pin	Function	Signal Name	Purpose/Direction
1	Frame Ground	FG	Connects the chassis to the AC ground
2	Transmitted Data	TXD	From the computer to the modem
3	Received Data	RXD	From the modem to the computer
4	Request to Send	RTS	From the computer to the modem
5	Clear to Send	CTS	From the modem to the computer
6	Data Set Ready	DSR	From the modem to the computer
7	Signal Ground	GND	Common to the world and computer
8	Carrier Detect	DCD	From the modem to the computer
20	Data Terminal Ready	DTR	From the computer to the modem

CONSTRUCTION HINTS

Before you burn your fingers and melt down a few connectors, make sure you have the right tools to get the job done. They are inexpensive and useful in other parts of the house, so if you don't have them already, add them to your shopping list. You'll need:

- A small (2-inch or so) bench vice to hold the connectors while you solder to them.
- A small (3- or 4-inch) pair of needle nose pliers and side cutter. (Avoid the kind of pliers with wire cutters; these don't usually work that well since often either the jaws or cutters don't meet.)
- A 15-watt or "temperature controlled" soldering iron.
- 60/40 rosin core solder.

Soldering technique is important when making reliable cables. Take special care to avoid overheating the connector. Some are made with nylon or other plastic that can be easily and permanently damaged by excessive heat. Be sure to use the thin diameter "electronic-type" rosin core solder rather than the type normally sold in hardware stores. (Hardware store-type is too thick for fine work and leaves black gunk on connections.)

You might want to consider having a "cable bee" at your user group. If four or five people get together to mass produce them, you'll be able to save your membership a lot of money and have a good group therapy session at the same time.

The RS-232 Switch Box

With the release of Valdraw and Valpaint, a problem many users soon experience is when both an external modem (such as a Hayes Smartmodem) and a mouse contend for the single RS-232C serial port available on the QX-10 and 16 computers. Manually changing the cables will eventually prove to be a painful drag. It isn't any fun digging around in back of a computer just to unplug one cable and plug in another, and it causes wear and tear on the computer connector and cables.

If you find yourself in this position, there are several solutions available. You can continue to mangle the back side of your computer until something breaks, throw money at the problem and buy a switch box to select your RS-232 devices (this will likely cost about $30 for another RS-232 cable and up to $200 for the switch itself), or make the switch box and cable yourself in an hour or two with less than $20 in parts.

THE MOUSE AND DIGITIZER CONNECTION

Mice and digitizers can use the modem cable described above without modification. Typically, mice

Software Critics Agree

SmartKey II Plus dramatically speeds up and improves accuracy in computing by letting you reduce multiple keystrokes to the touch of a single key. Thousands of practical applications. Available for both CP/M and MSDOS computers. Works to speed up your computing even while operating other software.

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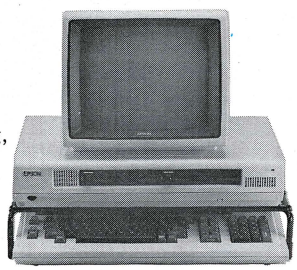
Teach SmartKey to recall software commands, words, paragraphs, or entire pages of data at the touch of a key. Make a series of "smartkeys" out of most of the keys on your Epson. Store "smartkey" definitions in a special file. Call them up whenever you want to run a favorite program or work on a project. Imagine saving complex software command codes, boilerplate paragraphs, inventory numbers, or whatever, and then injecting any of them into your work with the stroke of a key. SmartKey will not interfere with the regular operation of your keyboard. Indeed, SmartKey enhances your keyboard.

The Critics on SmartKey

- "Excellent..." *InfoWorld*
- "Works like a charm..." *MicroSystems*
- "A must for every computer..." Peter McWilliams, author *The Word Processing Book*
- "SmartKey is a utility I recommend... ...The result is less frustration and greater speed and accuracy in entering data." John D. Yoder, PhD *Reviewer — Epson Connection*
- "...SmartKey is considerably easier to learn ...SmartKey would be my choice..." Bob Hermann *Reviewer — Epson Connection*

Central's super priced **$49** *SmartKey II* combo pak includes *SmartPrint II Plus*, a program that greatly enhances the operation of dot matrix printers, and a free copy of Paul Golding's $15.95 book, *Screen Smarts, The Computer Tamer's Guide*. This book tells how you can use SmartKey to turn your computer into a supercharged mean machine. Order today to get this hard hitting $115 software & book combo for only $49.

Perfect Epson Stand



Simple, strong, sturdy, safe. These words describe an attractive stand that provides a perfect spot to place your Epson computer and monitor on. This stand is made from rounded, steel rods covered with a thick, shiny, soft, black polymer material that protects your Epson and table top from scratches. Unlike flat wood or acrylic panels used in other stands, the tough supporting rods of the Smart Stand (TM) do not obstruct air flow. Since your Epson is lifted off the table top and fully supported by this stand, air flows freely all around your computer to help keep it cool. When you need more space, simply slide the keyboard completely under the stand to create a working area on your desk. The Epson Smart Stand is a super value at $34. Try it for 15 days risk free. If not completely satisfied, return it for full refund. Matching 80 or 132 column printer stands are only $21.95. Order today. Get it fast.

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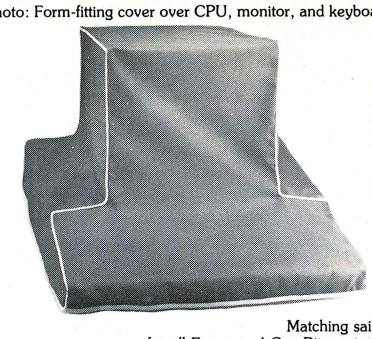
Photo: Form-fitting cover over CPU, monitor, and keyboard.



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compatible systems; no special hardv

Actual sample produced by an MX-80 and Fancy Font.

Incredible Printing Machine

Your Epson printer is going to get even better. *Fancy Font* can make it into an incredible printing machine. The *Fancy Font System* is a software program that turns the bits and bytes generated by your computer into over 30 font sets in sizes from 8 to 40 points that can be printed on any Epson MX80 with Graftrax, Epson FX or RX printer, or Gemini 10X printer.

Fancy Font styles include Roman, Bold, Italic, Script, Old English, and more. In addition, custom forms, invoices, labels, signs, foreign languages, mathematical notations, view graphs, resumes, newsletters, brochures, complete manuals, invitations, place cards, and high-resolution, proportionally spaced, letter quality business and personal letters can all be printed on your Epson printer with *Fancy Font* at the helm. *Fancy Font* is a product of SoftCraft Inc. You may have seen SoftCraft's national ads. They are printed with *Fancy Font* on an Epson printer. The ad is powerful visual medicine. The list price for the fully documented *Fancy Font System* is $180. Central's price is only $159. Order *Fancy Font* today and add an amazing sparkle of creativity to all your printed materials. Please indicate name and model of your printer when ordering. *Fancy Font* will make your Epson printer and Valdocs or CP/M word processor come alive. It's magical.

MORE ON NEXT PAGE

Radiation Screen

It's true. Computer terminals shoot dangerous ionizing x-rays at the operator. Exposure to ionizing radiation is cummulative. It doesn't wear off. Bit by bit, it keeps piling on. Too much exposure can lead to radical molecular changes. The kind of changes in the body that express themselves in cancer.

Sure, medical professionals use x-radiation to take pictures of the inside of your body, and to look through your face at your teeth. But, they know the danger of exposure to x-rays. That's why, when they work they stand behind lead impregnated shields. They're smart. They protect themselves.

If you're a computer user, the solution isn't to throw your computer out the window. It's easy to protect yourself against the ionizing x-rays that shoot out at you from your video display terminal. A company called ACCO International makes an excellent combination lead impregnated radiation shield and anti-glare screen that easily attaches to your terminal. It works. In fact, an independent study found that for every 1,000,000 x-rays your video display terminal shoots at you, only 125 will pass through the ACCO Shield. Solid protection.

The ACCO Radiation Shield is just like the ones used in hospitals, nuclear power plants, and at military stations. It's made from a lead impregnated, impact-resistant acrylic. Although the ACCO Shield is 30% lead, you can see through it. The ACCO Shield also doubles as a superior anti-glare screen that reduces glare and other bothersome reflections. The list price of the ACCO Radiation screen is $149. Central's price is $99. Order today. Satisfaction guaranteed. 15 day money back trial. Also comes with a free report that tells how the ACCO Shield stops radiation. Order today.

Attention: Consider that working at a video display terminal is like holding your face about 18 inches from a television screen many hours a day, five days a week. Protection makes sense. Order today.

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BORLAND INTERNATIONAL		
Turbo Pascal 3.0	$ 69.95	$ 58.00
Turbo Toolbox, Software Tools	$ 54.95	$ 47.00
Turbo Tutor, Step by Step	$ 34.95	$ 32.00
Turbo Holiday Pak, All the Above	$129.95	$ 99.95
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The Real Estate Consultant with The Creative Loan Consultant	$399.00	$349.00
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Prices, specifications, and offers subject to change without notice.

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Long Division	3-4	Elementary Chemistry	8-college
Funzeez	2-5	Basic Inorganic Terminology	8-college
Learning and Using Fractions	5-7	Chemical Symbols	8-college
Learning and Using Decimals	5-7	Inorganic Nomenclature II	8-college
Vocab Building	4-7	Metrics	7-12
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Letter Writing	6-8	SAT Score Builder	10-12

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Input for a *SuperFile* database comes from your word processing Valdocs, CP/M, or MSDOS program, so you can easily include information you already have into a database without having to re-key it. No fancy fields to define. This is a completely free-form database system. No programming language to learn. There's nothing difficult here. You can be up and running within minutes. *SuperFile* uses logical searching procedures to find your information fast. Tell *SuperFile* what information you want, and it searches from 60 to 400 entries per second. Save yourself the time and effort of filing and cross-filing information by hand or in overly structured data fields. The list price of *SuperFile* is $195. Order today to get *SuperFile* at our current low price of $155.

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T/Maker Integrated is a highly acclaimed powerhouse program that can turn your CP/M Epson into a computing workhorse. At last, you can enjoy productive computing like never before. Imagine doing full-featured word processing, relational database management, spreadsheet analysis, horizontal bar chart graphics, and checking your spelling all within the same program. No more switching back and forth between barely compatible programs to accomplish these simple tasks. *T/Maker Integrated* is universally acknowledged as a unique integrated software system that is just plain easy to learn. Now, there is an alternative to doing things the hard way. *T/Maker* can put the hidden and largely untapped power of your Epson at your command. *T/Maker Integrated* is regularly $450. Central is proud to offer this outstanding package for the low, low introductory price of $189. Yes, this includes the entire feature-packed T/Maker package, so please treat yourself to this excellent super productive software today. Experience the power of true software integration on your Epson. Order T/Maker today. Offer may not repeat, so order now.

Central Computer Products

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only send data to the computer and require only Receive Data (pin three) and Signal Ground (pin seven) to be connected. Summagraphic digitizers, such as those used with Valdraw, require both send and receive data from the computer, and so Transmit Data (Pin 2) should be included for these devices.

Given our present understanding of the cable requirements for both modems and mice, we will avoid switching all the unused RS-232C signals and build a very inexpensive switch box. Our parts list for the switch box includes three 25-pin male connectors and hoods, a miniature DPDT toggle switch (Radio Shack 275-636 at $2.69 looks fine) and a small instrument box (Radio Shack 270-231, $1.69) to hold the switch itself.

The overall cost of the switch box and internal cables will be less than $20, which compares favorably with three of Epson's #713 cables at $27 each, plus a $200 commercial switch box, the typical "store-bought" solution.

BUILDING THE SWITCH BOX

The switch box is actually no more complicated than building two or three modem cables, since the switch simply redirects the send and receive data to the appropriate connector.

You can keep your wiring straight by assigning colors to the pins. The color code convention I use is:

Pin 2 - Red - transmitted data
Pin 3 - Green - received data
Pin 7 - Black - signal ground
Pin 6 - White - carrier detect.

If you have a need for a switch box, you'll probably agree that the one just described is good, but if you are adventurous and willing to take a little extra care, the box and switch (which adds clutter to your operating position) can be eliminated entirely. I have been using this switch for the better part of a year on my QX-10 without a problem. There is a good chance you will find it more bug free than the software that uses it.

In addition to the connectors needed for the switch box, you'll need:

3 - 1N914A silicon diodes. Any general-purpose diode will do.

1 - .1 uf ceramic capacitor. Any voltage rating of 15 volts or higher is fine. Get the physically smallest unit you can.

1 - 12 kOhm, 0.25-watt resistor.

Figure 1. QX-10/16 Connector

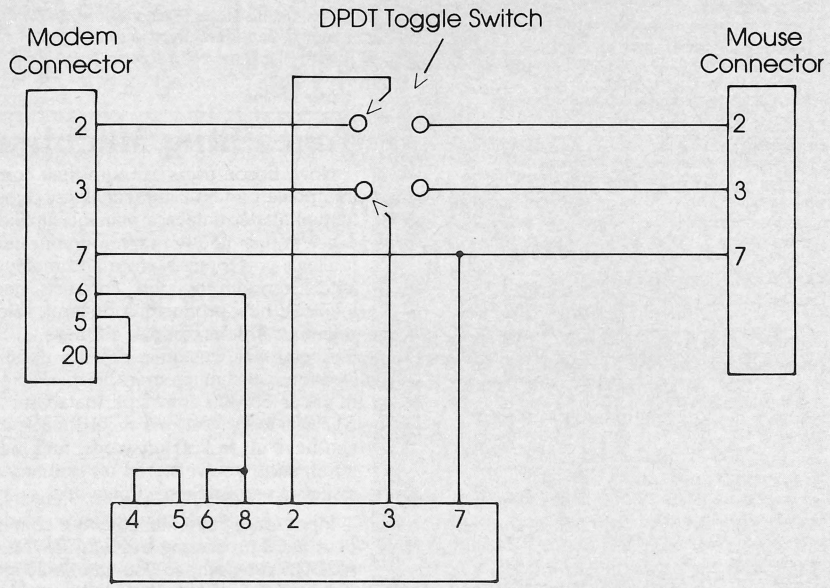


Figure 2 shows the wiring diagram for the automatic switch box. Let's take a look at how it works. First, the wiring to and from the modem connector is nearly identical to that shown for the simplified modem cable, except that the data from the modem is passed through diode D1. In a like manner, data from the mouse is passed through diode D2 on the way to the computer received-data pin.

Diode D3 is used to generate a negative reference voltage, which is connected to the received-data pin. This voltage restores the negative portion of the RS-232 signals from the mouse and modem that was removed by the rectifying action of diodes D1 and D2. (The signal at pin 24 is an unused clock sent by the QX-10 communications logic. Diode D3 and capacitor C1 form a halfwave rectifier to produce the required negative voltage.)

If you choose to wire your switch like mine, be sure your eyes and fingers are up to some really tight work. All components should be the smallest you can find so they will fit inside the connector hood.

Begin assembly by stripping and tinning two cables. I made my modem cable about 2.5 feet long and the mouse cable about 18 inches. This is arbitrary. I was also lazy; rather than buying an new spool of six-conductor wire, I used four-conductor cable and ran a single wire on the outside to provide the five lines needed by the modem.

Wire the modem and mouse ends of both your cables, carefully noting the color of each connector and making sure that you have used the right connector gender for these two peripherals.

Next clamp the connector to be used for the computer in a bench vise and get plenty of light on it. The wiring diagram shows numbers near the ends of each of the diodes. These are unused pin numbers on the RS-232 interface used on the QX-10 that I picked to serve as wiring terminals.

Begin wiring by jumpering pins 4 and 5, 6 and 8, then carefully position capacitor C1 above the connector pins and tack solder it on pin 12; arrange diode D3 and resistor R1; solder D3 on pins 24 and 12, but leave R1 at pin 3 unsoldered.

Next, lay in diodes D1 and D2 and tack solder them at pins 19 and 9. Now is a good time to check your hood to make sure that it will go over the wiring thus far.

By far the hardest part of the job comes next. Carefully wire the ground wires going to the modem and mouse connectors on pin 7. (Do not be tempted to use pin 1!) This is a thankless job that must be done neatly without solder splashes to the adjacent terminals or insulation burning but still be mechanically solid.

Once the ground connection is made, it's all downhill. Solder the computer transmit data wires to pin 2, again taking the care necessary to insure a sound connection. Finish the cable wiring by connecting the receive data wires from the mouse and modem to pins 19 and 9. Inspect your work to make sure no solder shorts have been made and the wiring is solid. Loose joints or poor solder connections will only come back to haunt you, so carefully inspect your work now.

TEST THE CABLE

Testing is simple; plug in the computer and modem connectors, leaving the mouse alone for the moment. Call up your MAIL program and attempt a connection to a bulletin board system; if this works, plug in the mouse and run ValPaint. If all is well, install the connector hoods and you are done.

If you have trouble, try the mouse without the modem and see if it is ok; if so, your most likely problem is a wiring error in the modem logic. The following is a quick checklist of possible problems.

1. Modem won't reset - Wiring error on pin 20 of either the modem or computer connector.

2. Modem won't dial - Wiring error on pin 2 of any connector.

3. Modem resets and dials, but nothing received - diode D1 bad or wired in reverse; something wrong with the negative voltage bias network D3, C1, R1. The voltage measured at pin 3 of the computer connector should be some negative value more negative than about a half a volt. Voltage at pin 12 should read about -6 to -9 volts.

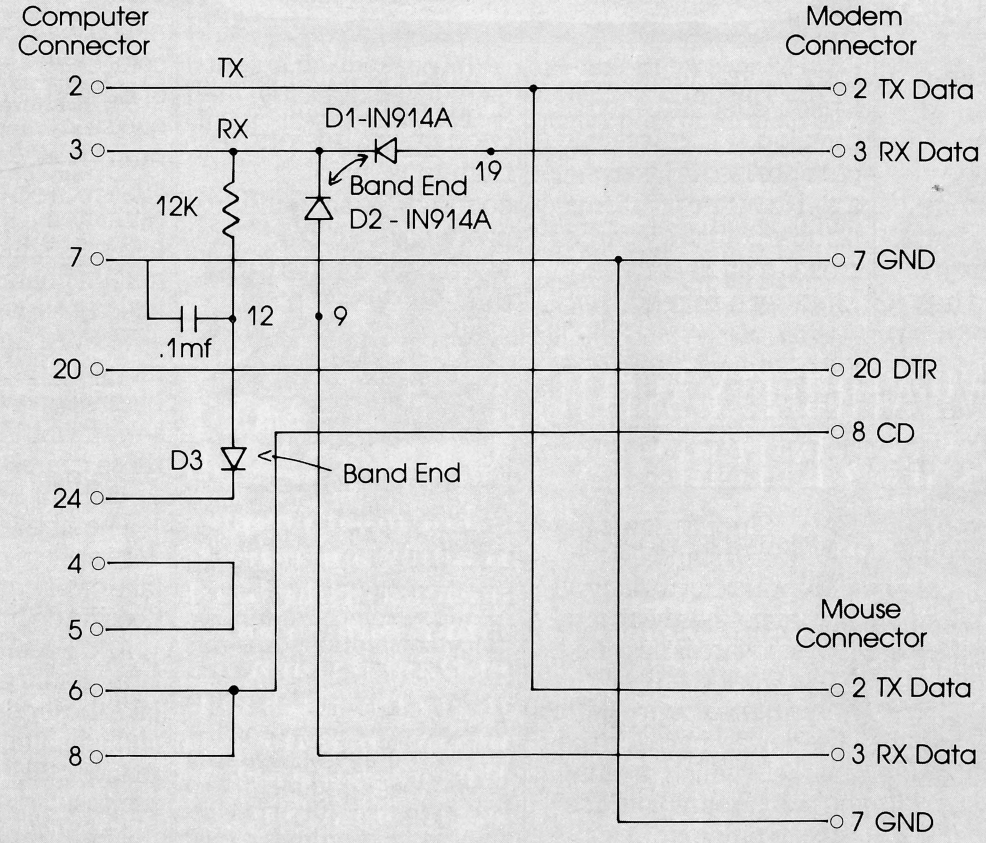
4. Mouse doesn't work - Diode D2 bad or wired in reverse direction; check negative voltage bias network.

ENJOYING THE FRUITS

Once you've gotten the automatic switch cable running you can largely forget about it and the painful cable swapping you probably went through. The only time you are likely to have a problem is during MAIL when you move the mouse (put it on a piece of black or white paper) or when the telephone rings while you are using the mouse.

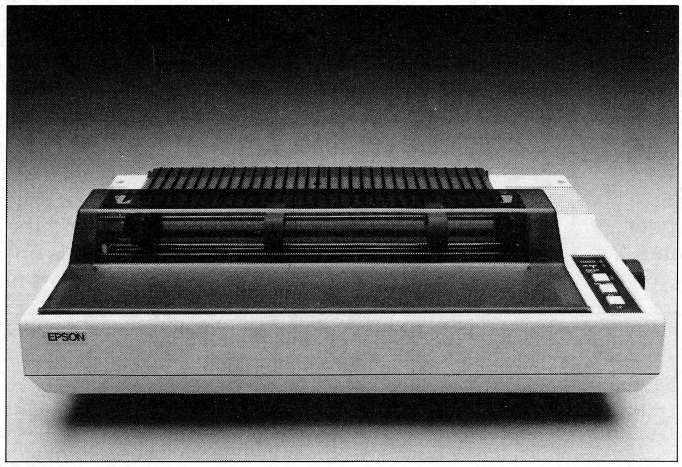
In both of these instances you'll have data being fed by both sources at the same time, and the result will be that the computer will get a little garbage. The precautions are obvious, and the problem is non-fatal. Enjoy this one; it is worth every bit of the effort needed to build it. ●

Figure 2. Automatic Switch



My, how printers

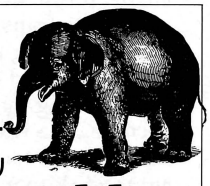
MOST EPSON PRINTERS HAVE BEEN RUNNING LONGER THAN MOST PRINTER COMPANIES.



In this age of temperamental office equipment, Epson® printers seem to be one of the few things that never break down. This reliable, worry-free performance has been characteristic of Epson ever since we developed the first low-cost printer 20 years ago. No other printer or printer company comes close to such proven, long-term reliability.

Which is why most of our printers have been operating longer than most printer companies. And will probably continue working after many of them have stopped.

The most forgettable printer you ever bought.



The main reason large companies think so much of Epson printers is that once they're bought, you rarely have to give them another thought. With an estimated 5 million lines between failures. And 100 million characters between new print heads.

They're easy to use, many with simple push-button typestyle controls, so you won't be hearing those complaints or frantic calls for help.

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And Epson printers are famous for being able to take those odd little bumps and crashing falls that render other equipment useless.

As for our full year warranty, well it's reassuring to have. But nobody seems to need it.

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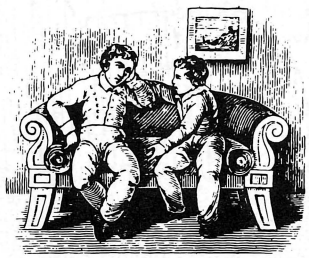

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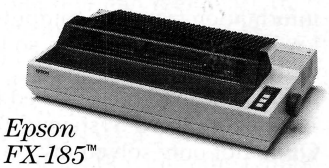

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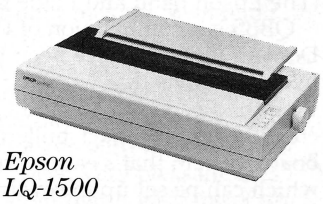

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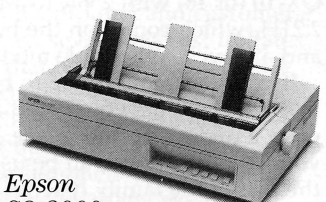

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ON-LINE WITH THE QBBS

By Don Brown

The QX-10 Bulletin Board System
Lawrence Davis
P.O. Box 756
Montrose, CA 91020
$30.00

Have you ever wanted to call your computer from a remote location, or have friends (or strangers) be able to call your computer to read and leave messages, or maybe even send you a letter or public domain software? I recently had the need to be able to get information from my computer while I was several miles away, so I started looking for a way to do it.

In my search, I discovered the QX-10 Bulletin Board System (QBBS). QBBS not only solved my problem of remote access to my system, but also allowed me to start a small bulletin board for our local Epson User Group (The Epson Band and Bugle Club).

QBBS is a combination of Public Domain files that have been modified by Larry Davis that work together with the Epson QX-10 (and QX-16) to create a very compact bulletin board system that's easy to run and which can be set up in several different configurations. The minimum hardware configuration is a QX-10 (or 16) with 256K RAM, CP/M 2.21H (which comes on the boot disk) and a Hayes-compatible modem.

If your system is going to be "on line" all the time, you would also want a dedicated phone line, but your regular phone can be used until the rest of the family lynches you. A hard disk would be handy if you're going to run as a public bulletin board, but is not necessary at first.

The system comes on two floppy diskettes, a "boot" disk and a "run" disk. The boot disk has the needed CP/M operating system and a complete installation guide along with several system files. After making your system backups, print

out the Installation Guide and read it from front to back (about 15 pages).

On my disks the guide was written using Valdocs. The guide is complete and easy to understand. It has enough "techie" stuff for those that want to do extra fancy things, but is also simple enough for those who bought the QX-10 because they didn't want to become a computer expert.

THE RAM WHAT AM

QBBS runs on a 167K RAMdisk that is created by the boot disk and which is very fast; this is also the reason that it will operate on a two-floppy disk drive system and still have enough free space to be useful. Of course, as with most everything, there are some tradeoffs.

Since the system is in a RAMdisk, there is a possibility of losing caller information that has been compiled since the last backup should your power fail. (A very simple backup utility is included with the system; with that you can minimize your chances of losing information.)

I do two backups a day; one in the morning and another one at night. The size of the message files affects the time required for the backup process, but my average time is only 4 or 5 minutes. If your power is not reliable, you can use a version of QBBS that does not use the RAMdisk at the expense of available free disk space.

QBBS provides a host of options allowing you to design either an "open" (public) or "closed" (private) system. The Installation Guide provides a complete explanation of each type of bulletin board system, pointing out the good and bad points of each. There is also an editorial by Larry Davis that explains some of the responsibilities of a bulletin board operator that you should be aware of if you plan on running a public system.

The QBBS bulletin board system is flexible; if you need access to your computer from remote locations, it can be set up to allow only you to use the system. Or if you want to run a public board, special privilages can be assigned to individual users. The system even provides a "twit" status to trap those users (seems there is always at least one) who leave obscene messages or constantly try to crash your system.

The minimum access on a public board allows first-time callers to read messages (including one that explains how to become a member of the board) but not leave public messages or enter any other part of the system. They are allowed to leave a sign-off message to request membership.

Once callers are board members, they can be given access either to the BBS only or be allowed to enter CP/M to upload and download files. Special users can be given access to places in CP/M-land that only they may use. This is handy for special interest groups (SIGs) or user groups, as it gives them a place to leave messages and files that pertain only to them.

> QBBS is a combination of Public Domain files that have been modified.

MESSAGES

QBBS provides a number of messages that are designed during set up, or by using almost any word processor except Valdocs. Messages can be easily changed any time, but all must be set up at least once when the system is initialized. The following messages are provided by QBBS:

Welcome: this message is displayed when the phone is answered.

New User: a message that is shown to all first time callers.

Bulletin: a message to list special news events and announcements.

Two special messages are provided for "special users." One is used to explain special user functions. The other is the same as the bulletin message except it can only be read if you are a special user.

DISK MANAGMENT

QBBS is a "safe" system. The system operator is the only one who can actually delete messages. (When a caller deletes a message, it is simply flagged so it isn't displayed. The message itself is still on the disk and available to the system operator.)

Unattended, deleted messages that are left on file consume valuable space in a floppy-oriented system. This and other problems are resolved by using a housekeeping utility program provided with QBBS. Messages can be automatically deleted, purged or archived as you see fit.

USER MESSAGES

A message editor on the QBBS system makes message entry a breeze. This editor allows corrections to be made within a line, or lines to be inserted or deleted at any time before the message is stored. Messages can be public (addressed to all users) or addressed to a single person; "personal" messages can be read only by the addressee and the system operator.

Callers to QBBS are informed of any messages on the system that are addressed to them. The system also keeps track of when the caller last called and the messages that were read on that call so that a user doesn't have to re-read all the messages; they can pick up from the last time they were on the system.

SYSOP PRIVILEGES

As the system operator, you can interrupt a caller at any time (from the host computer, not remotely) to chat with them, or if you need the system you can issue a notice that tells the caller to finish up — after 2 minutes the system hangs up on them. You can also put a caller on hold to let you work within the QBBS system without hanging up on the caller. This allows you to change user status or put requested files on the system without making them hang up and call back later.

There is also a "who's there" function that will tell you the name, address and time of any active call.

My experience with the QBBS system has been very pleasant. It is a reliable system that is easy to set up and maintain. Larry Davis, the author of the system, has had a continuing interest in his product and customers. I have gotten several no-cost updates from him that have been sent unsolicited; he sends them to the board in the middle of the night.

My first bulletin board system experience stemmed from the need for remote access to my system in order to avoid dragging my computer all over New Hampshire and Maine. Since then I have enjoyed running it as a "semi-public" system, available to club members and friends.

If you have similar needs or just plain want to try your hand being a Bulletin Board Operator, QBBS is probably the easiest and least inexpensive way get your feet wet.●

Boolean Logic

About two millennia lay between Aristotle and George Boole. It's logical to study both men's work.

By Jim Hansen

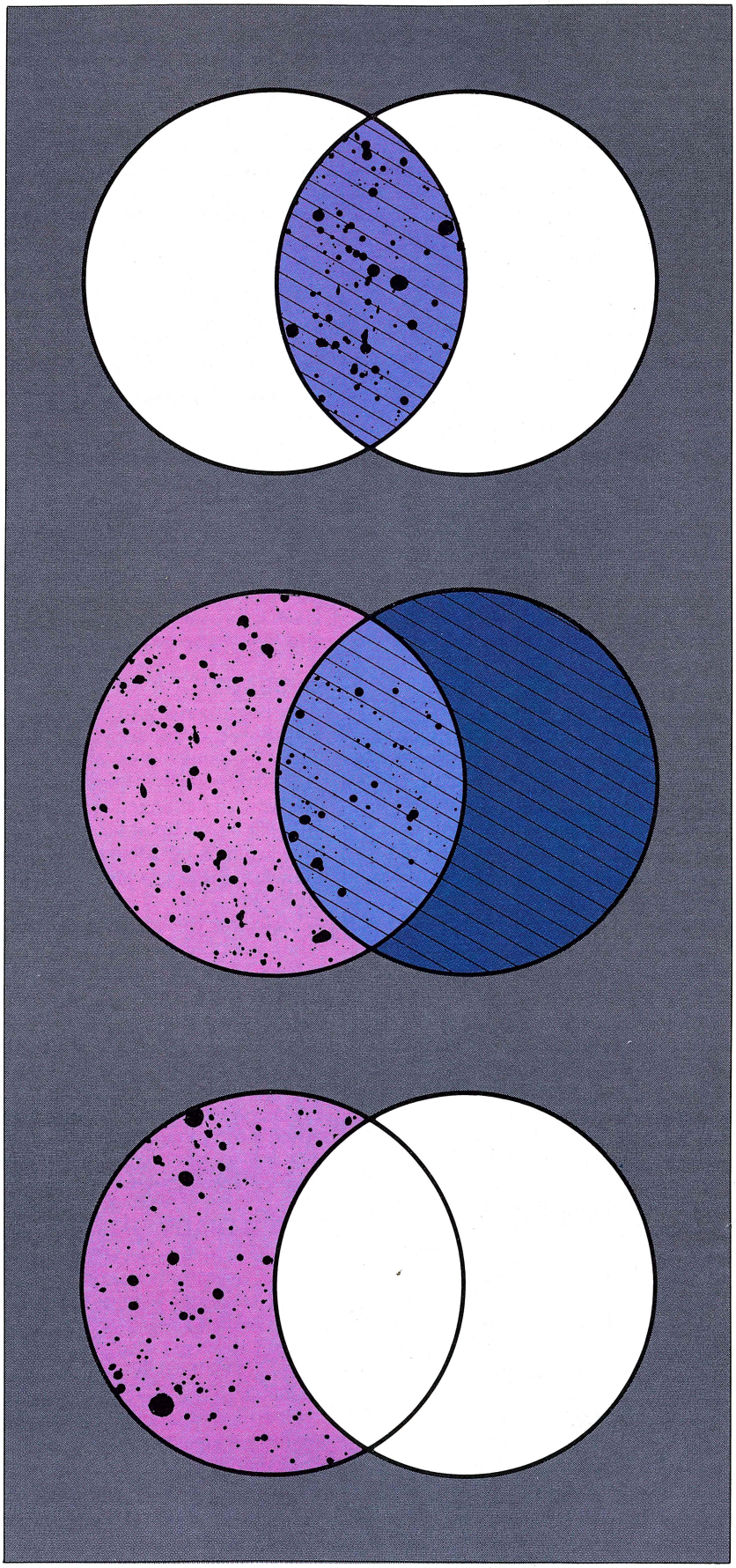
The science of logic has a colorful history. Conventionally, the historical periods have been divided into three eras: traditional, Boolean and mathematical.

The traditional, or Aristotelian, period began in the fourth century BC. The Boolean (or algebraic logic) period began in 1847 with the publication of *The Mathematical Analysis of Logic,* by George Boole. This period lasted through the end of the 19th century. The mathematical logic or logistics period began with publication of Gottlob Frege's *Bregiffschrift* in 1879, but did not really begin until 1910 when Alfred North Whitehead and Bertrand Russell published *Principia Mathematica.*

This too-brief history neglects many developments in logic: the different forms of ancient and medieval logic, the 16th century critique of Peter Ramus, the 17th century Port-Royal logic in France, plus the substantial contributions throughout history in China, India and the Arab world.

Aristotelian logic remained the predominant influence in logical thought for about 2,100 years. It took the work of a self-educated son of an English cobbler to replace it: George Boole. Boole's logic was superseded in less than 50 years by further developments; the only remaining vestige of it is in the algebra he developed.

Dormant for about 50 years, Boolean algebra was discovered to be useful in analyzing relay switching circuits by Claude Shannon in 1938. Its application to the precursor of digital logic was described in Shannon's master's thesis at MIT. Boolean algebra is still used in the design of digital logic and computers, although other analytical techniques are slowly reducing its importance once more.



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the education of Athenian lawyers and politicians, originally had a simple goal: to separate valid and invalid arguments. Since the time of Aristotle, logicians have tried to formulate rules that will ensure that only true conclusions are drawn from true premises. These are called the rules of underlying argument.

An argument is valid when no counter-example exists. A counter-example is produced when one can reason a false conclusion from a set of true premises. The idea is to avoid such invalid arguments and any rules of inference that permit them.

Here is an argument that can be handled by Aristotelian logic:

All men are mortal;
All Greeks are men.
Therefore: All Greeks are mortal.

In Aristotelian logic, this is a valid syllogistic inference in the first figure, and in the mood AAA. The figure is determined by the position of the middle term (men), and the mood depends on the kinds of statements. In this case the statements begin with "ALL." The mood AAA means that the premises and conclusion are each statements in A, or all.

The rule of inference in this example allows us to generalize the form of the above premise:

All M are X;
All G are M.
Therefore: All G are X.

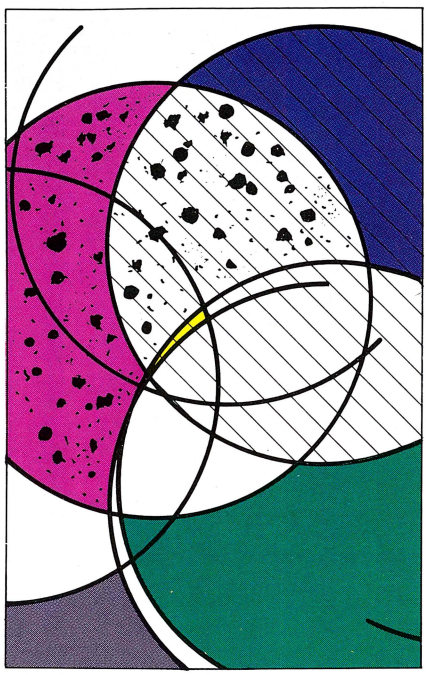
Any argument of this form, no matter what one substitutes for M, X and G, will be valid.

Aristotelian logic developed either 15, 19 or 24 such valid syllogisms, each of which were fully specified by moods and figure. The number of inferences depends mainly on whether universal "All" statements imply the existence of their subjects.

The weakness of this logic is that there are cases that cannot be handled. In other words, it is not entirely a generalized system of logic. Here is an example where the syllogism cannot be extended to cover a new inference:

Sally is the mother of John;
John is the father of Tom.
The mother of the father is the paternal grandmother.
Therefore: Sally is the paternal grandmother of Tom.

The above argument can be formulated in the language of Aristotelian logic:



All A are B;
All C are D;
All E are F.
Therefore: All A are G.

In spite of an obviously valid argument, there is no valid rule of inference supporting the above form, so in this case the logic fails.

The reason is that phrases like "mother of John," once merged into a single term (B), cannot be separated out again. In this case substitutions can be made for the letters A through G that will produce a counter-example, making the inference invalid.

ENTER BOOLE

George Boole's logic attempted to show how it was possible to deduce the conclusions of all the traditional modes of reasoning — for example, the moods of the syllogism — with the aid of a mathematically-oriented system related to conventional algebra. His system worked on a vast number of other conclusions and arguments that could not be handled by Aristotelian logic.

After Boole's logic became known, the importance of the syllogism became a restricted form of class-inclusion inference: not wrong, but very inadequate.

This is the first of a three-part series. Next month, Mr. Hansen will examine the algebra of sets and classes, and Boolean algebra. Part three will describe how Boolean algebra is actually used in digital logic design. ●

continued from page 7

(including "preliminary documentation") was sold with the promise that all future revisions would be sent free of charge.

This marketing "strategy" is probably all that has held RSI together so far. It allowed RSI to make further cuts in the testing and quality control staff, and at the same time, customers who get "the latest" version of the software generally consider it a good deal since they will never have to spend another penny on Valdocs 2+ software. They have become what amounts to a RSI's software testing facility.

Despite aggressive marketing, RSI has had to further cut costs. A second round of layoffs took place near the end of October and included the entire documentation staff.

Near the end of 1985, Titan Technologies announced a blow to future users of MS-DOS on the QX-10 by terminating further production of the MS-DOS expansion board. Once current supplies of this board have been exhausted, the QX-10 cannot be upgraded to run MS-DOS software.

Contrary to the upbeat reports flowing out of RSI, it would appear that the Valdocs experiment is nearing a conclusion — one that users dedicated to the system will not like. RSI's marketing strategy was the only one that would let it stay in business long enough to get an operable version of Valdocs 2 on the market. But since all upgrades are free, once this market levels off or becomes saturated there will be no more revenue to fund further development.

Our next issue will examine more closely the MS-DOS option for QX-10 owners and the Epson Equity systems targeted to the MS-DOS market. There is an entirely new world to be discovered in MS-DOS, one which the Epson community has thus far largely ignored.

And quite frankly it is an exciting world with software systems as easy and fun to use as Valdocs, plus a whole lot more. There are hundreds of companies beating their brains out to make better mousetraps for the user. And it is a world that all Epson owners should be aware of.

Epson World will support both the QX-10/16 and Equity camps. If you are apprehensive about the future of your computer, consider this: your system and software, except for repairable mechanical failure, will perform as well twenty years from now as it does today. Unless you change the rules ("It must run faster!" or "It must do something new!"), your system as it stands today does not need further "support" unless the computer itself breaks or you erase all your system software.

But for all the new systems available today, and I've tried a good many, I still come back to my trusty QX-10. Nobody, but nobody, comes close to the QX-10 keyboard, screen and system reliability. The QX-10 is the best damn computer ever made.

— Jim Hansen

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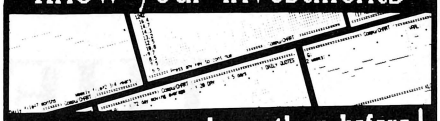

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THE UNABASHED CANNONBALL

A lap of America with an Epson laptop.

By Eva P. Thompson

Spring has sprung. Time to get out and ... race around the country.

May 3 will mark the start of the third annual Cannonball One-lap of America road rally, beginning and ending in Detroit and passing through 16 major cities around the country. The eight-day One-lap race is a legitimate and legal event, unlike its predecessors where the object was to speed across the country in as short a time as possible without getting hurt or arrested.

In contrast to the races of old, the One-lap has some rules and challenges to it — and even some modern technology. It is a time-speed-distance (T-S-D) road rally, where the object is to reach the specified checkpoints in the exact time it is supposed to take; no earlier, no later. The race is sponsored by the Uniroyal Tire Company and is sanctioned by the Sports Car Club of America (SCCA).

Duane J. "DJ" Lane is one of the drivers competing in the race. He, partner Ivan Pato and a third driver will be in a $50,000 Hartge Motorsports BMW, and will have an Epson HX-20 computer along. Lane has written a computer program entitled D.A.M.M.I.T. (for Digital Analysis of Mile-Minutes in Transit) that performs the complex navigation mathematics found in T-S-D road rallies.

Lane has 20 years of road rallying and electronic data processing experience, and will be the navigator and computer operator for the team. It will be his responsibility to keep them from getting lost (a disaster in such a closely-timed rally) and to check their on-time position at least once per minute to keep them on schedule.

"Our BMW will do 150 miles an hour," Lane says. "It accelerates from 0 to 60 in 6 seconds! But most of the time we're on public streets and highways, and navigation, not speed, is the key."

GETTING THERE ON TIME

T-S-D road rallies pit each vehicle against the clock. Rally organizers provide each entry with a set of detailed instructions that define the vehicle's course.

In order to win, drivers must arrive at the checkpoints exactly on time. The timing is so close that drivers are penalized one point for each *second* they are early or late. Speeding is penalized, and will cause the car to lose the rally as surely as arriving late will.

Timing speed and distance over this 8,300-mile course across the country is critical. You can do it with a stopwatch and pocket calculator, but the real competitive racers rely on computer technology to do the measuring.

The extreme accuracy that is needed in navigation is made much easier by a fast system for calculating minutes-per-mile. The less time spent on determining on-time position, the more a navigator can concentrate on keeping the driver on course. It is very important to have a "system" that is better than your fellow competitors'.

Lane claims his program to be superior because of its flexibility. It is written in BASIC, and utilizes only the most common keywords. It will run on just about any portable computer and can be easily interpreted and modified by anyone with a moderate understanding of BASIC.

The program exists in two forms. The first uses a small, interfacing "black box" to input, in real time, a remotely-sensed mileage signal directly into the computer's RS-232 port. By using the mileage signal along with the computer's internal clock, D.A.M.M.I.T ascertains if the rally car is ahead or behind time. It then displays the necessary output to inform the driver and navigator how much to speed up or slow down to stay precisely on schedule.

During the Cannonball the direct mileage input version will not be allowed. D.A.M.M.I.T.'s second operation mode involves manually inputting mileage from the keyboard — it has no expedient method of navigating. Even in the actual mileage input form, Lane says it is superior to all the dedicated navigational microprocessors used by his competition. He finds his program more reliable, simpler to use, less expensive and safe because a complete backup system is available .

Used with the Epson HX-20 computer, D.A.M.M.I.T. offers a state-of-the-art solution to rally navigation, Lane claims. The HX-20's CMOS microprocessor runs at 1.6-megahertz, providing a winning combination of lower power consumption and high performance in a laptop computer, Lane thinks.

"We think we have a tremendous advantage over the competition," he says. "The HX-20 and our program could be the difference between winning and coming in second ."

Or so DJ Lane hopes. He won't have time to worry too much about it during the actual rally; he'll be too busy taking his minute-by-minute accounts of time and position. Along the route there will be four race tracks, where the drivers can burn off a little steam and break the tension by just driving fast. Except for that break in routine plus one 18-hour hiatus in Los Angeles, the trip will be non-stop. For eight days, Lanes team and its competition will be obsessed with calculations in an attempt to avoid as many penalty points as possible. And may the most accurate team win. ●

CHOOSING WORDSTAR

Its speed and versatility make it worthwhile.

By Richard Shoemaker

The most difficult task a microcomputer user faces is matching software programs with applications. This is why the first-time computer buyer should always select the software that will accomplish specific goals, and then choose the hardware that will run it.

As a monthly columnist, word processing was my first priority. I needed a program that would be easy to use, so I could concentrate on what I wanted to say rather than on the mechanics of inputting the text. Initially, I had hoped to fill this need with Valdocs 1.16, but its performance was too slow. I finally selected the HASCI version of WordStar.

WordStar has a reputation of being difficult to learn. The HASCI version removes most of this difficulty, because it shares a large number of Valdocs editing commands. These include the unshifted and shifted cursor keys, file control keys (except MAIL) and typestyle keys. In addition, many of the CTRL commands are identical or very similar. To achieve a mediocre level of performance, the translation from Valdocs to WordStar took less than an hour.

After a year of WordStar use, I am still learning more and more about the power of the program. The commands CTRL KS and CTRL QP save a document to disk, then return you to the place in the document you were when you started; this is especially handy with long documents. This procedure is similar to the Valdocs MENU and UNDO commands. While it seems like the WordStar commands are more difficult to remember, the difference in speed is well worth the extra effort.

There are several built-in advantages to using WordStar on a QX machine. The biggest improvement is in the speed. When the program is first called up, it loads itself and two related overlay files into the RAM disk. This means it is possible to use both disk drives as data disks. The only requirement is to have a disk with the CP/M system in drive A. It is possible to use CP/M 2.2 or 2.21 in drive A after initially booting up with CP/M 2.25 or one of the B versions, as long as you remember to use a CTRL C to tell the computer you have changed disks. I really like having that much storage space.

The Valdocs ability to spool and print is superior.

WordStar has sold more copies than any other single word processing program, and nearly every business computer (CP/M and MS-DOS) has had the program adapted to it. This includes the Epson Geneva. WordStar also uses the same commands on all computers, except the HASCI version. Once you have started using it, you will notice the command CTRL KD appear on the upper left of the screen when you use the STORE key. CTRL KD is the plain vanilla command to store a document. By paying attention to the commands that appear as you use the HASCI version, you will learn the commands you will need to use WordStar on any computer. This transportability of skill with a single software program gives the user the ability to make any computer useful.

WordStar text files are also transportable between all computers. If you have a copy of Uniform or Convert to copy files between different computer formats, you can edit, print, or revise files created on other computers.

WordStar and Valdocs share two common characteristics. They both use text files that are heavily filled with high-bit control characters. (These files are not standard ASCII. If you look at them using Indexer of the CP/M type command, the files will not be readable.) The second is that WordStar also automatically creates a temporary file of your text, and if you are editing a file you previously stored, the previous version is saved as a backup file.

Unlike Valdocs, WordStar allows the user to write programs in "non-document" mode, as true ASCII files. If I want to manipulate a file with a different word processor, I use a public domain utility program called T.COM to strip the high-bit control characters from WordStar files. WordStar handles larger files than Valdocs. If the backup files, temp file, and working file exceed the space available on the disk, the backup file is automatically deleted.

WordStar also allows me to run another program from the main menu. This operation is very similar to the Valdocs Menu key. You do have to log to the disk where the program you want to run resides. I use this ability to run one of my database programs to create a report I will then merge with a WordStar document.

The main menu also offers two other options. MicroPro's SpellStar and MailMerge are designed to integrate with WordStar functions. MailMerge allows the insertion of text to create form letters, standard contracts, leases, or other documents you might want to mass-produce that contain minor variations. SpellStar is a spelling proofreader.

I like and use MailMerge to communicate with my clients. I am able to insert names and even specific advice that is only for a portion of the entire mailing. But instead of

SpellStar I use WordPlus from Oasis Software.

There are many reasons to select WordPlus. It will work with every word processor, including Valdocs files, and if you rename the Word Plus's start-up program, SPELSTAR.OVL, it can be run from WordStar's main menu.

WordPlus allows users to view a potentially misspelled word in context, ask the dictionary to look up one or more suggested ways the word should be corrected, add it to the dictionary, or discard it. There are a few other word utilities included, but they are not powerful enough to consider in this article. The ability to select a specific auxiliary dictionary to use with its rather large main dictionary is elegant. (If you are writing a technical document, you should use an auxiliary dictionary, as a typo in a general-purpose document might be a correct word in the technical document.)

Some of my detailed proposal work requires the use of footnotes, or referencing specific tax codes. Because WordStar is the closest thing to a universal word processing program, a FootNote program (Digital Marketing) as well as a Thesauras (Writing Consultants) and a Punctuation (Punctuation & Style from Oasis) program all reside in my personal software library for use with WordStar.

> The difference in speed is worth the extra effort.

In addition, a text-based database program from Digital Marketing called NoteBook is compatible with WordStar. While NoteBook is limited to 20 fields, it allows me to use variable field length of up to 4,000 characters, with a limit of 32,000 characters for a single record. I like to use this program as both a database and an outline processor. It would also be useful to create MailMerge data files.

Mail List Manager from PeachTree is my favorite to keep membership records and other files that lend themselves to fixed-length fields. It allows a report to be sorted and written to a disk file to be imported into a text file or another database, and excels at printing mailing labels. On the same disk, I keep a copy of the public domain program, PRINTER.COM, to set my printer to bold elite for label printing. This utility program also allows me to set my Epson printer to compressed print and change the line spacing to squeeze more information onto labels to add to a Rolodex or disk labels. It also works well with NoteBook to print continuous postcards.

NUMBER CRUNCHING

A great deal of my professional work is with numbers, stock quotes and catalog values. I have found FormManager from little-known Bit

Richard Shoemaker is a financial consultant, computer magazine columnist, and president of the National Epson QX-10 Users Group. He is located in Lemont, Pennsylvania.

EPSON SOFTWARE

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Software to be extraordinary. It allows users to define a form up to two full pages, and insert spreadsheet-like formulas into the form's definition. If a client has 2,000 shares of XYZ, purchased at $2.50 a share, and I know the commission rates of the broker involved, I can automatically calculate the paper profit or loss after commissions are deducted at the current quote *and* automatically insert the calculated data in the proper field(s) of the record. It is even possible to show the result in purchasing power by discounting the results by an inflation factor.

The FormManager program's reporting abilities include totaling the various fields included in the report. Many people will find this program adequate for inventory control, stock portfolio reporting and commission accounting. Because this program is only available in MS-DOS, I use Uniform (Micro Solutions) to transfer the reports into CP/M and then insert them into the proper text files.

I am enthusiastic about FormManager, but I offer one caution about it: The documentation is not designed for a novice. Any moderately experienced spreadsheet user will find the program easy for them to master. The manual is currently being revised to make it suitable for even the inexperienced user, but I have not been told when it will be available.

I don't want you to think that I have neglected Valdocs. I use 2.0 when I need a spreadsheet or need a telecommunications program. Valdocs 2.0 offers a spreadsheet that is easy to use, large, and does not require that I continually refer to a manual.

> FormManager's documentation is not designed for the novice.

One mistake many people make is to attempt to select a single database program, or single word processing program to perform all of their database functions, or all of their word processing functions. It is actually more cost effective to select specific programs for specific purposes. So far, I have listed three different database programs. Each has advantages, and not one of them can do all of the things the others do. Mail List Manager is good at double checking against entering the same data twice. NoteBook offers the flexibility to handle large variable sized text entry, and FormManager can perform math functions usually reserved for spreadsheet or statistical programs.

Other programs, dBase II for example, can do many of these things. But at least in the case of dBase II, the time required to set it up just the way you want it would probably be better spent actually entering or manipulating data with a program ready-made to your particular need. WordStar fan that I am, it is not the ultimate. The Valdocs ability to spool and print documents while editing is superior to WordStar's handicapped editing abilities while it is printing. •

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EPSON *WORLD* OF ART

Scott Cardozo of Contoocook, New Hampshire is the winner of the Epson World of Art. Scott's entry, the beautiful (but scary) dragon pictured on these two pages, was created with Valpaint on an Epson QX-10 equipped with a color board. A Diablo ink-jet printer allowed the full force of the dragon to be captured.

Scott, who is still in high school, has been interested in computer graphics for some time. He described a program of his, SDraw, in the Spring 1985 issue of Epson World.

As the winner of the Epson World of Art contest, Scott will receive a new Epson LQ-1500 printer, compliments of Epson America. We thank Epson America for its participation in this contest.

Epson World would like to take this opportunity to thank the many people who submitted entries to this contest, and we applaud each of you for your efforts. The Epson QX-10 is no longer manufactured by Epson, but the creative spirits of its owners lives on. It is quite a kick to see members of the QX community discovering all the abilities of their favorite computer.

Special applause goes to Mr. Cardozo, for his truly stunning creation. Congratulations, Scott, and best wishes for future projects. ●

THE KAMAS OUTLINE GENERATOR

A knowledge processor to amplify your mind.

By Lonny J. Brown

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Kamas (rhymes with "famous") is the acronym for Knowledge and Mind Amplification System, and the product lives up to its ambitious if somewhat esoteric name. It is a high-class, but very accommodating tool for generating, ordering, managing and accessing information.

A multi-layered system, Kamas offers several interactive modes, including a menu-driven outline processor, a text editor, a menu generator, a macro programmer for customizing text management and a BBS telecommunications program. Plus Kamas' inner layers contain a complete structured programming language for writing new applications, or expanding or modifying the system itself.

Its creators use the analogy of the modern automobile: you can use it to get where you want without knowing how it works; or, if so inclined, you can open the hood and do your own engine modification and fine tuning.

OUTLINE GENERATORS

The first and most refined face of Kamas is the outline generator. What spreadsheets do for numbers and word processors do for text, outline programs do for concepts and knowledge. They are sometimes called "idea processors."

Outliners operate at the level of context and meaning. They mimic the way we think and order our own vast mental storehouse of knowledge: by groupings, association and natural hierarchies of information. All intellectual activity is based on our capacity for such pattern recognition. Computerizing the process makes for a quantum leap in potential productivity.

For any kind of organized writing, outline software is the ultimate tool. Whether the project is an extended shopping list, a speech or a doctoral dissertation, it enables you to let your ideas flow freely, see their connections, fill in the spaces spontaneously, and relocate any size segments of your material. Upon first acquiring such power, veteran writers have been known to experience a sense of near intoxication.

The most noticeable advantage over word processors is the outline generator's ability to hide (or reveal) subordinate categories of information. By doing so it maps the depth as well as the surface of data and provides a choice of either detailed particulars or a broad overview of the entire subject. An example of this ability is shown in Figures 1 and 2, for a project entitled "Kamas software review." The expanded outline can be shown by hitting a single keystroke.

MAIN MODES

Outline Editor: Kamas' outline editor comes with its own introductory manual and a lesson on creating an outline/file. For many, this will be the module used the most, if not exclusively, and it would make Kamas worth having even without the system's other features. It's like a clever super-indexer, allowing you to view, order and display data in a wide variety of ways. You soon learn how to travel forward and back on an outline tree, or step down and up its branches.

For example, hitting the space bar once expands the next descendent level of the outline, and takes you forward on that level. Hitting the RETURN key displays the text leaf belonging to the stem you're on. You can view a stem of the outline in relation to its ancestors and descendants, or in the context of its immediate "neighborhood." You can easily promote or demote items in the hierarchy, while Kamas takes care of indenting and tagging them. Hidden text leaves and whole subordinate branches are brought along when a title/stem is moved. Individual stems and their text leaves can be "read-only" protected against inadvertent editing. Any section of the outline can also be outfiled separately to disk. With all these abilities, Kamas invites you to preserve your ideas not only quickly, but where they belong, in natural relation to each other and the whole.

Basic concepts and definitions are important in Kamas because the command keys are mnemonically assigned. There is some room for confusion until you become acquainted with Kamas' choice of terms. For example, the documentation uses the metaphor of a tree to describe the outline structure, but neglects to point out that it grows *down* from the top of your outline. The root structure of the tree might be a better image, but going down the page is actually moving forward in Kamas terminology. And what one might think of as moving "out" onto a branch Kamas calls "down" (as in subordinate). It's all a matter of semantics. A few more schematic illustrations in the manuals would be helpful. Along with the tree metaphor, Kamas also uses geneological terms to help explain the outline: items below (hierarchically) are "children" of those above; all children on a branch are "siblings."

Figure 1. Condensed Kamas outline.

```
+ KAMAS SOFTWARE REVIEW
        + INTRODUCTION
        + MAIN MODES
        + PROCEDURES
        + MISCELLANEOUS
        + SUMMARY
```

Figure 2. Expanded Kamas outline.

```
+ KAMAS SOFTWARE REVIEW
        + INTRODUCTION
                + Electronic Outline Generators
                        . examples
        + MAIN MODES
                + Outline Editor
                        . Leaf Editor
                + "ROVE"ing (in the "Topic Environment")
                        . File Management
                        . KAMAS helps
                . "JEX"in (in the "Expanded Topic Environment")
                . Programming
                . Telecommunications
                . User Applications
        + PROCEDURES
                . Initializing
                . Formatting
                . Printing
        + MISCELLANEOUS
                . Newsletter
        + SUGGESTED USES
                . Project Planning, Scheduling, Calendars
                + Teaching
                        . Instructional Programs
                . Library & Research Data
                . Flow Charts, Expert Systems
                . Decision Path Analysis
        + SUMMARY
                . Conclusions
                . By-line
```

Leaf Editor: Once you have the semblance of an outline, and at any point in its growth, you can easily slip into a writing mode and generate text. The Kamas Leaf Editor is a simple but sufficient generic screen editor, with Perfect Writer-like commands by default, or WordStar by alternate configuration. Valdocs users will of course notice its elementary nature and absence of dedicated keys, but it's worth the sacrifice for certain kinds of writing projects. The Kamas Leaf Editor has word wrap, block moves, string search and replace, paragraph reformating, a reversible delete buffer, and a complete command menu on-line. Cursor commands have both mnemonic and arrow-key aliases. It does not have tab setting, underlining or character replace.

Each "leaf" of text is limited to 2,240 characters (about two typewritten pages), but leaves can be "split" for expansion — Kamas will prompt when this is necessary — and printed consecutively (with or without titles supressed), to make continuous text output possible.

While writing, you can quickly jump out and view your outline, and come back into the text-leaf with a keystroke or two. Text can be saved (with or without editing), printed, transferred to another leaf in the outline, or another topic, provided it is active ("mounted"). You can also outfile to disk any or all of your outline and text as a separate CP/M file, for retrieval into a spell checker or another editor.

ROVEING

Besides the Outline and Leaf Editors, Kamas' other main interactive mode is ROVE, a versatile Topic Environment from which you can perform all the above outline functions, plus formatting, printing, file controls, execute jobs from the outline or user-created applications, check system status and parameters, and exit to CP/M. You can also see at a glance which outline titles have leaves of text attached to them: they are flagged with an "&." Key word searches in ROVE even allow for misspellings and phonetic variations. As with the Outline Editor, you can go anywhere in the outline, or remotely view (query) other areas without moving from the current location. Another nifty little feature is an option that turns your entire outline into a series of nested, itemized menus for choice by number.

File Management: A file in Kamas is called a topic. You must designate a size in K-bytes when you "prepare" a new topic. The average is 64K. Underestimating your needs for file space could be a big headache, but Kamasoft has made a utility program available on a supplemental disk to re-size existing topics. Kamas will display both file size and percentage used, on command.

Given adequate storage facilities, Kamas will accommodate topic/files up to 8 megabytes in size, plus access as many as 16 topics at once. (Drive search-order is specified in a setup procedure.) Topics may be locked up with an owner name and password.

When exited, Kamas automatically names your topic with the first eight characters of the top title in the outline, and sends it to disk as a standard CP/M, ASCII file, stamped with the suffix .TOP. All .TOP files available in all drives are indexed and displayed when Kamas first boots, or whenever you invoke a Topic check. Dates of file creation are shown, and the current topic is indicated with an arrow.

Kamas' resident file is called Systopic. It contains necessary utilities, error messages and help menus. It is the default topic, and must be available in any drive when working on any other file. Once you get to know the system and its programmed languages, you can streamline it for more space or special uses.

Kamas Helps: The Help structure in Kamas is superior. As with Valdocs, Kamas' on-screen help messages are readily available, and context-sensitive. They can be set to appear in any of four levels of assistance. At the highest, Kamas briefly announces current mode upon entry, reminds you which keys invoke help (usually

"?" or "ESC-h"), and prompts for secondary help. You can later strip off these training wheels for more disk space. You can abort any operation with CTRL-C, or ESCape any environment/mode at any time. Kamas' error messages, called ABENDs, for ABnormal ENDings, are always accompanied by an audible tone, an explanation, and relevant suggestions. When the program is busy with a task, it tells you what's happening. In all, Kamas is very good at keeping you informed.

"Jexing" (Job Execution): Kamas is built in five layers, or "environments." Each has its own characteristic prompt and vocabulary. The outer two are the interactive Outline and Leaf Editors, and the ROVE Topic Environment, already described. The third layer, known as the Expanded Topic Environment, is a built-in text interpreter. With it, you can custom design and name your own macro sequences of commands to work on the text database. They can be entered at a command line, or installed as text leaves and executed directly from your outline. Such "jobs" can even be tied together and executed automatically, or "AUTOJEXed."

Kamas' fourth layer, or "Program Environment," is a complete and sophisticated programming language. In technical terms, it can be defined as "a high-level, fully extensible, compact threaded interpretive language with iterative and conditional control structures, macros, recursion, built-in data types, top-down design with bottom-up coding and I/O." In some respects it is designed like FORTH, but its commands are unique. It responds to its own vocabulary, which is extensively documented.

Finally, at the core "System Program Environment," Kamas makes available its own "primitive" machine language. In other words, is is "written in itself." For the more experienced or adventurous hacker, this means an ability to enhance, expand, and otherwise customize the entire system or any of its component parts. Two thick technical manuals cover some of the endless possibilities. There is even a theoretical chapter called "Zen and the Art of Knowledge Processing."

Initializing: When first run, Kamas takes you through a one-time initialization procedure to configure itself to your hardware. There are no problems here for Epson owners, and there are several special features: Kamas can be instructed to use the QX's internal clock for date stamping outline entries, and if you have CP/M 2.2 (A or B), which creates the "M:" ramdisk in memory when booting, you can make excellent use of it.

Kamas has short commands — most are one or two keystrokes, with no RETURN necessary — but it still has to wait for your computer's mechanical drives to spin up the data from the disk. Access and display is then twice to ten times faster, and the drive motors are left silent.

Note: When using the RAMdisk, you must remember to copy your new work out of memory and onto a floppy or hard disk before shutting down. For this reason, it becomes useful to install the transfer utility PIP permanently on the system disk. PIP will automatically overwrite any

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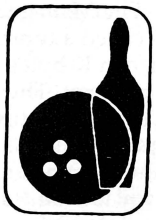

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outdated version of the topic/file on the data disk. (INDEXer will work as well.) There is also room for CP/M on the Kamas system disk, so it will auto-boot, at least to the A> prompt. You simply type "Kamas" to invoke the program.

Formatting: Options for output formatting in Kamas include Margins, Left or Full (left or right) justification, page break, title hiding, and clear. These can be applied globally or by individual stems, from either ROVE mode or directly within the Outline Editor. Format settings are not remembered on disk; they all revert to default upon exiting the program. There is a formatted scrolling display for previewing data before printing.

ALL IN ALL

My only regret about Kamas is the primitive nature of the word processor. It's the only mode that feels at all cramped. A serious, full-time writer might not find it worth the sacrifice of features such as TAB setting, or recognition of whole-word strings and sentences for DELETE and cursor moves. However, this is precisely the type of enhancement that Kamas invites. Its creator, Adam Trent, tells us that improvements in the leaf editor are always being tried, but that space is a problem.

Another possible deterrent to the high-output writer is the limited capacity of the text leaves in Kamas: Every two pages or so, you must split the text and assign a new name to the current leaf. One compromise solution to these editing limitations is to build your document's general structure in Kamas, then transfer it to your regular word processor for fleshing out. Of course, you must then leave behind the outlining capabilities of Kamas. This is provided for through an outfile conversion option. However, it does not work all that well with the Valdocs editor: margins, line spacing and justification have to be manually reformatted.

What's worse, for some reason Valdocs 2 is as slow as molasses on a retrieved converted Kamas file. If you happen to have it, Peachtext does the job much more successfully. Also, Kamas will not accept back a topic outline that has been outfiled. This is an inconvenience if you want to correct errors flagged by your spelling checker: you must go to a separate word processor.

Registered Kamas owners receive a newsletter containing helpful tips, updates and program listings from the industrious folks at Kamasoft as well as other users. Kamas comes with its own telecommunications software, including remote control capabilities. The company has assisted several Sysops in establishing bulletin boards.

Kamas may not be as visually well-dressed as some other project management software, but it is smart, responsive, and has a way of continuously revealing more unexpected powers. Obviously, much thought and work have gone into its architecture.

If you want to learn Kamas, be prepared to pay attention. It seems unwieldy at first, because it is large and has its own lexicon of terms. A Glossary and complete index are included in the manual. •

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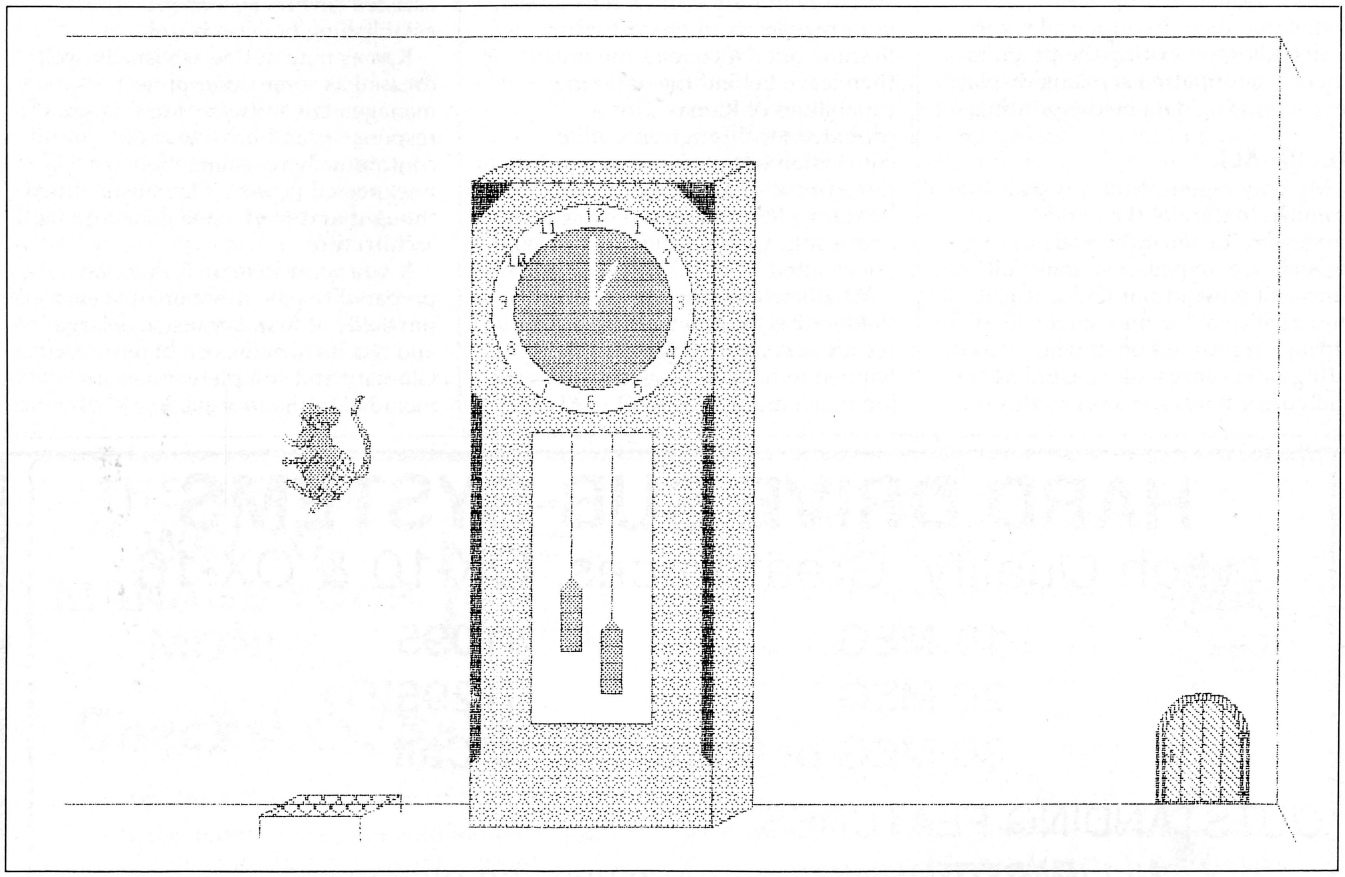
EARLY LEARNER'S TOOLKIT

Start 'em young.

By Joanne Metro Rothweiler



Is your child fascinated watching you draw graphs and charts on your QX-10 or -16 or when you create designs with ValDraw and ValPaint? Do you wish your pre-schooler could use the computer constructively?

Dan Oja, of the Independent Programmers' Guild, has created an excellent program for children three to six years old that teaches basics such as counting; letter, number and name recognition; how to tell time; and offers puzzles and reward incentives. The program is so easy to learn and use, you probably won't have to read the three-page, typewritten instruction material that comes with it.

The use of a reward system is clever and a real boon to learning. A child must correctly answer five questions in a row to earn a star. A few bars of music from a popular nursery rhyme also congratulates five straight correct answers. After 15 in a row, the child accumulates three stars and is entitled to a reward. Each reward is unique — a screen of detailed, animated graphics played out to the full tune of its respective nursery rhyme.

There is a cute lamb ambling up to meet Mary in "Mary Had a Little Lamb," a sky full of stars and a man in the moon that scrolls upwards to reveal a sleepy little village to "Twinkle, Twinkle, Little Star," a dog making his way home through the woods to sit wagging its tail as its master waves happily from his window in "Where, Oh Where Has My Little Dog Gone," and many others.

Using CTRL PRINT and an Epson dot-matrix printer, you can make a printout of any or all reward graphics. These can be used by the child to color with crayons or paints.

In addition to the basics, Early Learner's Toolkit provides an excellent draw mode using the numeric keypad, complete with heart and diamond fonts and an erase

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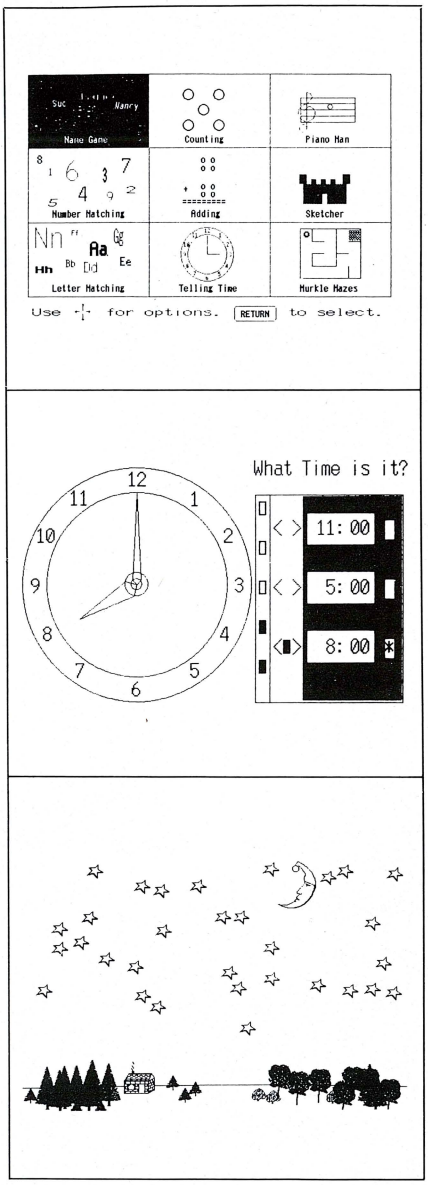
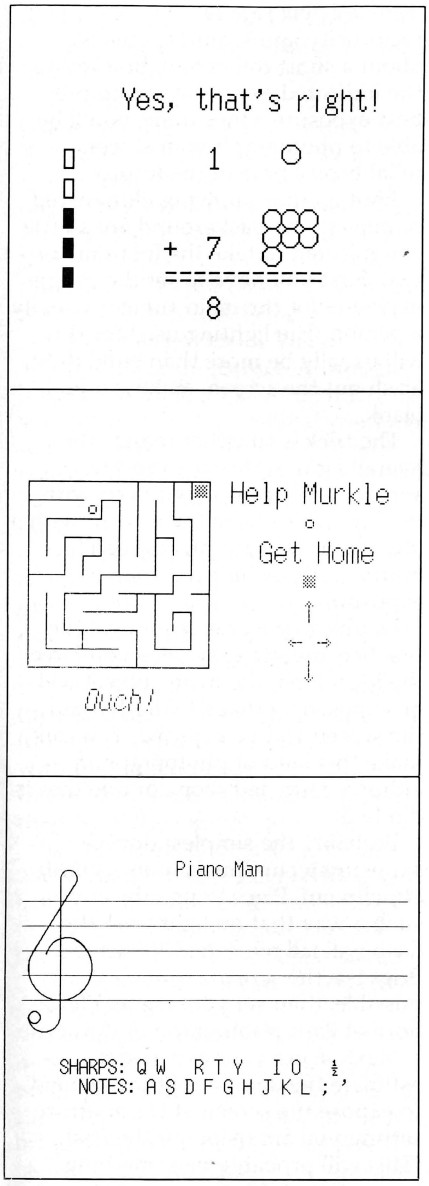


The main menu (top) is similar to graphics in the rest of the program.

capability. A name recognition feature lets a child see his or her name printed out letter by letter in various ways along with melodic tunes and charming visual presentations.

There's even a puzzle-type maze program called Murkle Mazes that can help teach directions. The child is asked to help Murkle get home. But if Murkle hits his head while finding his way through the maze, "ouch" will appear on the screen.

For a fun approach to learning music, Early Learner's Toolkit offers "Piano Man" — a blank treble staff. The child can place notes on the staff by selecting tones from certain keys on the keyboard. Whole notes from Middle C to high F# will then appear



The Toolkit teaches everything from how to tell time to the basics of music.

on their respective line or space on the staff, and the proper tone will be heard. It is possible to play simple songs in this way.

The opening menu depicts nine picture boxes labeled by function. Simply move the cursor to the box you want and hit return. The nine program modes are: Name Game, Counting, Piano Man, Number Matching, Adding, Sketcher, Letter Matching, Telling Time, and Murkle Mazes. To end any mode mid-way and return to the main menu, simply press CTRL C.

Adults will enjoy Early Learner's Toolkit, too. Best of all, it offers the opportunity for parent and child to play and learn together. ●

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You may order any of the past Disks-of-the-Month or send a self-addressed, stamped envelope to the address below to obtain a catalog of the disks (5 new ones have been added — 3 CPM and 2 MS/DOS). Cost is $10.00 per disk or 1-5 disks and $7.50 for each disk over 5 per order), payable by check or money order only.

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continued from page 11

reciprocity and scanning effects. Shoot a short roll of film, bracketing the indicated exposure to find the best exposure. Once done, you'll be able to photograph your screen reliably any time in the future.

Photographs showing illuminated screens in the background are a little complicated to take the first time or two. First you have to set the proper exposure for the main subject, usually a person. The lighting used for this will usually be more than enough to wash out the screen, making it look blank.

The trick is to either reduce the overall light in the room so the average amount is about even with the brightness from the screen (with a little practice, you can "eyeball" it pretty well), or set up a double exposure.

Double exposures require a little practice, but are easy once you have the idea. First, the main subject will be exposed, perhaps by flash, then the screen will be exposed. You can make this kind of photograph in either a darkened room, or one that is dimly lit.

Probably the simplest double exposure technique is to use a flash attachment. Place your subject in such a way that no light from the flash will fall over the CRT screen. Brighten the screen as much as possible, then set your camera for a normal flash photograph of the scene.

Next, using your experience, estimate the amount of time needed to expose the screen at the aperture setting you are using for the flash. (This will probably be something longer than 1/10 of a second.) Set your camera shutter speed for a slightly underexposed shot of the CRT screen. This generally looks better; if the screen looks too bright it will draw attention away from the main subject.

Toward Better BBS Usage

The Valdocs Mail system is a smooth and generally pleasant experience. Here are a couple of tips that make it even better.

1. Don't forget to fill out the USER I.D. section in MAIL. This is important since this is where your name (sent along with your file to

another Valdocs MAIL system), current area code and dialing prefix is located by the MAIL system.

2. You'll find it simpler to keep commonly used MAIL names short. You might, for example, make it a policy to abbreviate bulletin board names to three letters, such as "BBC" for "Bulletin Board Club." You'll find that three-letter combinations are much easier to remember than those made of four or more characters.

3. Don't forget about Valdocs' automatic log-on feature. Although initially confusing to set up, it is well worth the time, especially if you have to remember half a dozen different passwords. It is far easier simply to sit back and wait for the logging to finish.

4. The automatic log-on sequence can be cancelled at any time by pressing the UNDO button. If you have a bad connection and the bulletin board system takes a "hit," the rest of the log-on will just waste time because the sequence being sent from your computer is out of step with the bulletin board. Press the UNDO key, then manually complete the rest of the log-on sequence.

5. The "session record" is a most useful tool. It records everything sent from the bulletin board (including the text you type) in a special file called the session record. This file is saved in ASCII format and can be edited in any imaginable way.

If your phone connection is of reasonable quality (you don't see much phone line-induced garbage on the screen), you may find it faster to bring in a text file via the session record rather than using the normal MAIL file transfer program. Just start the session record (press the STORE key) then have the bulletin board list the file. Most text files can be quickly and easily transfered this way and you get the added benefit of being able to watch the data come in at the same time.

Speeding up SUBMIT

If you make use of the SUBMIT facility to handle some of your jobs automatically, you have probably sat listening to your disk drive buzzing away as the SUBMIT program executed. That buzzing is caused by your disk drive having to step across

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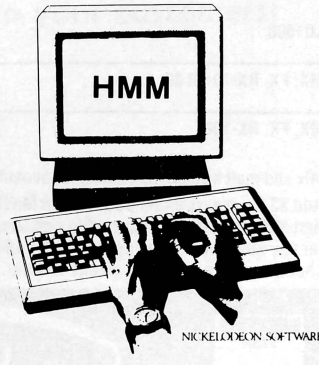

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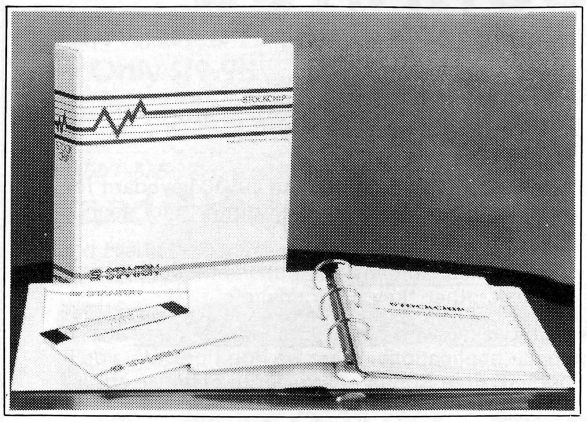

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large areas on the disk to access files there. This takes time and causes you to wait while the machine hums.

Much of the time spent on disk accesses can be saved by organizing the disk so that the required files are physically located near each other. Further, a hole in the unallocated disk area for a temporary file should be made for use by XSUB and/or SUBMIT. The entire disk organization job is easy, doesn't take long, and the results are enjoyed every time you use the application disk.

I'll explain the disk organization process by showing how I made up the disk I use for word processing. Although your files will be different, you can use the same procedure to organize a disk for your own application needs.

My word processing disk contains the usual CP/M B 2.25 system file, a few utility programs, and the PeachTree text processing, thesaurus and spelling checker files. My SUBMIT program (LOADUP.SUB) runs automatically when the system is booted. It moves the PeachText processor files, SD.COM (the public domain sorted directory program), and a short "include" document file to the M: RAMdisk supported by CP/M, then switches the default drive to drive M: and quits. Before disk organization system initialization this process took over 70 seconds; now it completes in less than 48 seconds from the time the QX-10 reset button is pressed, a time savings of over 31%.

Here's how to make a copy of my disk. Begin by formating a blank CP/M disk, then copy the CP/M operating system and .SYS file to it. Next, from your TPM disk, copy ZPIP.SYS and rename it to ZPIP.COM. (I'll explain why ZPIP rather than PIP in a minute.)

Next, copy the SD.COM, XSUB and SUBMIT files from your CP/M disk. Rename the copy of SD.COM to XXX.X; SD.COM will be loaded again a little later. (The XXX.X file is used to reserve physical disk space for use by SUBMIT; it will be deleted later.) Next copy the following list of files:

LOADUP.SUB—The submit file used to autoload the M: drive.

PTMENU.COM—PeachTree text processor files.

PT.COM.

EDIT.COM.

SD.COM—The Sorted Directory program.

PRINT.COM—PeachTree printing

program.

PT.THE—PeachTree thesaurus.

PTHELP.DAT—PeachTree data files.

QT.COM—A typing program I use to address envelopes.

SP.COM—PeachTree Spelling Checker programs.

SP.DIC.

SP.PTR.

Of the above files, only those between PTMENU.COM and PRINT.COM are moved to the M: drive; the other files are left on the disk and can be loaded in any order you like.

The final steps are:

1. Erase the file XXX.X to clear a physical space on the disk. This space will be used for a temporary file by the SUBMIT/XSUB operation, and being physically closer to the files being processed, speeds up the operation. Caution! Once this file is erased, do not write new files to it because they will "fill" this empty space (and take additional space as required). This will cause your SUBMIT utility to revert to the old "slow access" disk buzzing mode of operation.

2. Using the CP/M SETUP operation, enable the AUTOBOOT program to run "SUBMIT LOADUP."

The following is a listing of my LOADUP.SUB file for use as a reference. I have added remarks to the right of each program line; these are not a part of the file itself, and are for reference only.

I mentioned earlier that ZPIP should be used rather than CPM's PIP. The reason is that ZPIP has a command (";Q") that allows a keyboard input to terminate the program. In PIP you must type a blank carriage return to drop out of it — something that apparently can't be done by the SUBMIT utility.

The common alternative, using PIP, is to load it each time a file is to be copied:

```
PIP M:=PTMENU.COM
PIP M:=PT.COM
etc.
```

This method is fine when single files are being copied, but since PIP is loaded from the disk each time a file is moved, the operation is slow and cumbersome when several files are to be moved.

Be sure to rename ZPIP.SYS to ZPIP.COM before using. It must be renamed with a .COM file extension or it won't run in CP/M.●

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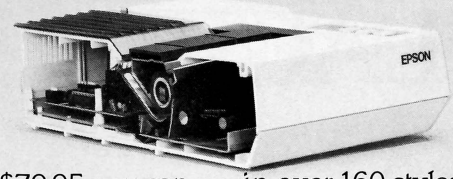

Now for $79.95 you can own the rest. You see, today's new dot matrix printers offer a lot more.

Like an NLQ mode that makes their letters print almost as sharp as a daisy wheel. And font switching at the touch of a button—in over 160 styles. But now, a Dots-Perfect upgrade kit can make your printer work like the new models in minutes. At a fraction of their cost.

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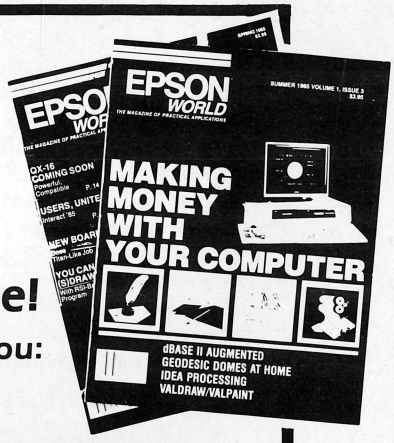

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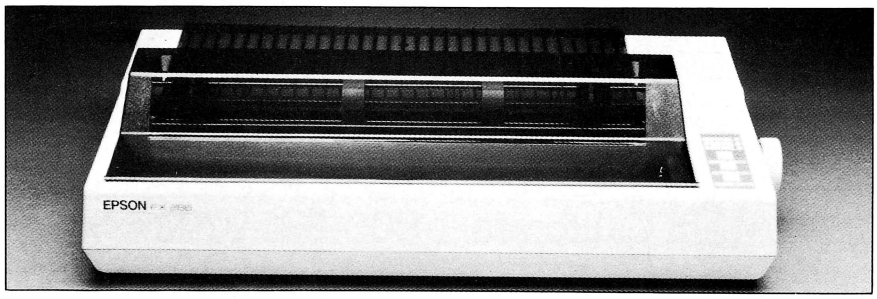

The Epson FX-286 dot-matrix printer is the replacement for the FX-185. There are two main differences between old and new: the FX-286 prints at a maximum speed of 200 characters per second (cps) compared to 160 for the FX-185, and the new printer emulates an IBM 4201 Proprinter instead of the 5251 emulated by the FX-185.

The FX-286 is a 136-column printer, operating in 9 by 9 draft mode and 18 by 18 near letter quality (NLQ) mode. In NLQ mode, it runs at 40 cps, compared to 32 cps for the FX-185. A front-panel switch changes printer mode as required.

The new printer has Epson's traditional parallel interface, with selection by DIP switch of either Epson's Standard Code for Printers (ESC/P) or emulation of the IBM 4201.

An 8K print buffer is standard, expandable to 32K. Graphics capabilities include downloadable character sets and user-definable characters. Graphics and text can be mixed, and text can be output in six character pitches ranging from 5 to 20 characters per inch.

The FX-286 retails at $749 and carries Epson's standard one-year guarantee. A friction and tractor paper feed are both standard. Options include a serial interface board and cut-sheet paper feeder.

Epson America, Computer Products Div., 2780 Lomita Blvd., Torrance, CA 90505.

Circle No. 101

Geneva Update

Epson is trying to boost sales of the laptop Geneva PX-8 through literature; how-to guides that teach program operation. Three new books deal with various aspects of Geneva ownership.

"Portable WordStar for the Portable Epson PX-8" is published jointly with Bantam Computer Books. It begins with a simple description of how the Geneva works, then proceeds through instructions on how to start and edit a document, work with control keys, and use the Geneva's microcassette. Printing and telecommunication of files is also discussed.

This guide unfolds into an easel that can be propped up next to the computer. Chapters are divided by tabs. The book lists for $16.95.

"Portable Calc and Portable Scheduler for the Portable Epson PX-8" describes the programs in its title. There are 10 chapters devoted to applications. Use of the Geneva as a calculator, checkbook file and invoice preparer are among the general applications; more narrow uses include recording of personal expenses, schedule depreciation, portfolio management and personnel allocation.

The book is arranged in a flip-chart format, and also lists for $16.95.

A third publication, "Executive's Guide to the Epson Geneva" is two bucks cheaper at $14.95, and includes chapters about WordStar, Portable Calc and Portable Scheduler. A walk-through of CP/M is also included, as are instructions for using the modem.

Epson America, Computer Products Div., 2780 Lomita Blvd., Torrance, CA 90505.

Circle No. 103

Price Cut

Aggressive pricing is Epson's answer to selling the JX-80 color printer. The new price of $399 is more than 40 percent off the unit's original $699 listing.

The JX-80 is now positioned with the FX-85, a printer that has become almost a de facto standard in the low-end dot-matrix printer market. The color printer is in fact similar to Epson's FX line, printing at 160 characters per second (cps) in draft mode. Its distinguishing feature of course is its four-color ribbon.

Elite (12 characters per inch) and pica (10 cpi) type are among the unit's 160 type style variations. The most commonly used type styles can be accessed from a front panel feature called SelecType. Epson points out that many software packages from companies such as Lotus, Sorcim, IMSI, Advanced Graphics, APG Software and SoftKey can be used with the JX-80.

The JX-80 comes with both friction and tractor paper feeders and the company's standard one-year guarantee.

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Circle No. 102

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We just made "instant gratification" affordable.

Now you can renew your love affair with your QX-10 in a *BIG* way. When you plug our disk emulator card into one of your computer's expansion slots, suddenly you have fast access to as much as 2 megabytes of your VALDOCS or CP/M favorites — access *SO FAST* it makes even a hard-disk look sleepy.

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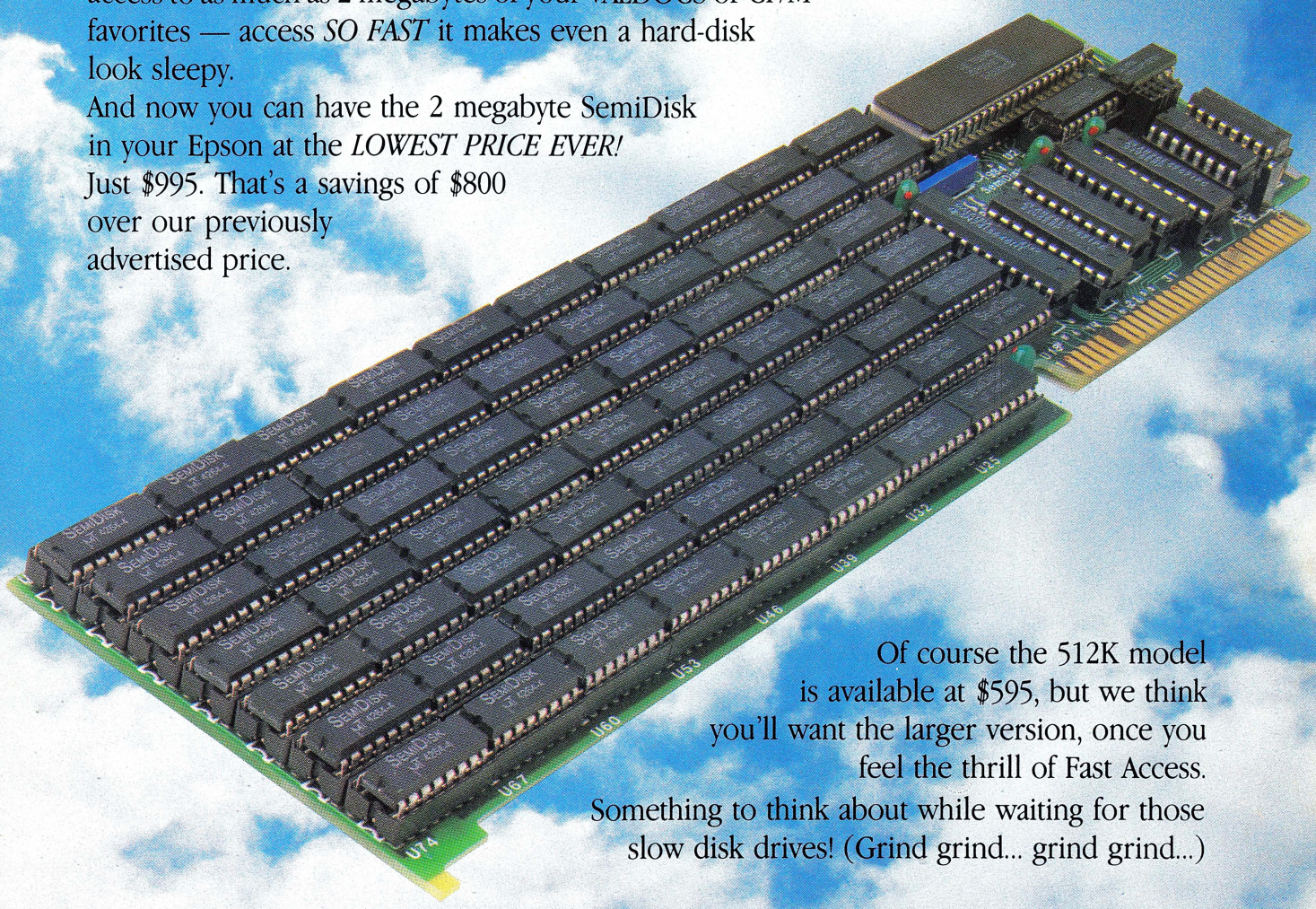

Of course the 512K model is available at $595, but we think you'll want the larger version, once you feel the thrill of Fast Access.

Something to think about while waiting for those slow disk drives! (Grind grind... grind grind...)

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Circle 32 on Reader Service Card

"Why we had a strong case for buying an Epson PC after owning an IBM."

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Not only is it fully compatible with all the software and peripherals we use on our old PC, but the Equity I, II, and III models have more features and better performance than the corresponding IBM PC, XT, and AT.™ Things that IBM adds to your bill, like MS-DOS™ software plus serial and parallel ports, are standard on the Equity. And each Equity model uses the improved AT style keyboard.

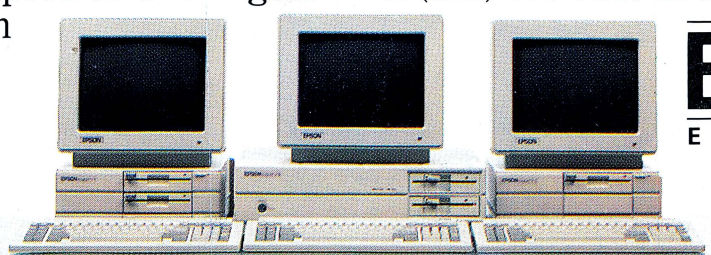
All the evidence points to Epson's superior value.

In point of fact, the Equity II, which we selected, comes with 640 KB of memory and a dual speed CPU for higher performance and even more productivity. Add in a very attractive price, and you end up with a motive for buying Epson that stands up under any cross examination.

What really swung the verdict in Epson's favor was their solid reputation. Even with our old PC, we had an Epson printer. And like the product, their service and support were terrific. Epson's dealer network and technical staff treat the little guy just like a member of the Fortune 500. And the Equity even comes with a one year warranty.

We waited a long time before buying a second computer. But in our professional opinion, the time to buy an Epson Equity is now. As far as we're concerned, it's an open and shut case."

For more facts about the Equity line of personal computers, call 800-421-5426, or (213) 539-9140 in California.



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